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THE GOVERNMENT OWNERSHIP QUESTION.

Much space is being devoted by the press of the country at this time to the rumors emanating from Washington to the effect that President Wilson and his cabinet are considering the question of government ownership of the interstate telephone and telegraph lines.

The most tangible foundation for the speculation about nationally-owned telephone and telegraph wires, however, is the statement that Representative David J. Lewis, of Maryland, "the father of the parcel post," is preparing a bill to be introduced in congress during the coming session with this end in view. The fact that Mr. Lewis achieved his parcel post plan, and that it is meeting with success, naturally lends significance to this report.

No doubt information of this proposed legislation is permitted to leak out in order that public sentiment may be tested. It is said that the Maryland congressman is engaged in an investigation of the subject, including the working of nationally-owned telephone and telegraph lines in other countries, and that he has discussed the matter with President Wilson and the postmaster-general whose department would naturally fall heir to these new activities. Neither, it is declared, has gone on record as to the government taking over the wire business.

The magnitude of the undertaking, of course, is tremendous and already wise friends of the administration are pointing out that it would be prudent for the post-office department to show that it can run its own affairs efficiently and economically before reaching out for other tasks to do. It is assumed that if the government decided to engage in the telephone or telegraph business, it would confine its operations to interstate service. But even that would mean an investment which would add a mighty load to the national debt. Besides, if the Interstate Commerce Commission can sufficiently regulate the railroads without owning them, the question is asked, why would not the same be true with regard to the telephone and telegraph industry? It would, no doubt, be ordinary wisdom first to try regulation before attempting ownership.

Representative Lewis' investigations are said to show that in Europe a government-owned telephone line charges 48 cents for a 700-mile message which would cost in the United States something like $3.25. If instances like these can be established, the movement looking to the nationalization of long distance telephone lines will grow in favor. Of course, the argument against points like this is that the government doesn't have to show a profit like a private corporation. When the government has a deficit at the end of the year, there is an appropriation made to cover the loss—and the people pay it. This is what the post office department has been doing for years, and the public has been taxed to make up the shortage.

In discussing the matter, the Electrical World takes the ground that government ownership would result in a deterioration in service by telephone and telegraph. Besides, it says, "the acquisition of the telegraph lines without the telephone lines, or of the telephone lines alone, would put the government in competition with the properties not acquired. It would mean that either the unacquired properties and the government would have to agree on rates or that one competitor would feel the stress of competition. Such a contingency as government competition with privately owned telegraph or telephone lines is remote; but it is well to point out that some of the rumors now being circulated undertake to commit the government to a policy that is not far from the seizure of private property without due process of law and without proper compensation. Those who have proper property rights should be protected in them against a policy of confiscation or dangerous approach to that discreditable course. The government should be free from any suspicion of operations of this character."

The Interstate Commerce Commission now exercises jurisdiction over telephone and telegraph companies engaged in interstate business and since last February has been conducting an inquiry looking to the regulation of this service. If properly managed, it can solve the problems involved without recourse to government ownership.

You Can't Change the Odds

By HERBERT KAUFMAN

You can't change the world's odds, so change yourself.

The rules of life were made thousands and thousands of years ago. They're hard and fast, but fair.

It's a big game, this contest for existence. A ceaseless and an eager and splendid gamble, in which there must be losers. But the world keeps winning and the welfare of humanity at large is the big thing.

We have kept progressing, we have mounted from savagery to civilization; from civilization to supermanhood. Tomorrow is mightier with promise than all the yesterdays, clear back to the first stir of reason.

The failure of individuals is a necessary by-product of advancement.

Evolution cannot be achieved by gentle means. When the mill is busiest, the sawdust piles highest.

So, even if a few, including YOU, have not realized your probabilities, the vast majority of men are constantly achieving betterment.

We are battling for a higher estate. The struggle is everlasting. The battalions of courage are ever pushing onward. The cost of victory will always be heavy, yet always worth the price. YOU have no guarantee of security.

Fate issues no insurance policies, but efficiency and intelligence, grit and steadfastness, caution and common sense, and moderate restraint of passion and appetite, all tend to safeguard your chances.

There is no warranty that even those who strive the hardest will fulfill their ambitions. On the other hand, dogged, upright, fearless, full-faithed humans generally succeed, and idlers and liars, cheats and sluggards, and whiners and parasites, are certain to fall.

The more we gain in wisdom, the more clearly we see the injustice of wasting time on doubters.

There was never a moment when it was so easy to demonstrate ability, and to sell it on terms so nearly approximating its actual value.

Buck up and make good! Look at the telephone, the skyscraper, the locomotive, the automobile and incandescent light. Realize how far society has marched in a century. Consider the crude tools and the scant knowledge with which your ancestors dealt. Then measure your lot in contrast. If ever Providence smoothed the way for anybody, it's you.

The implements and the materials and the blue prints are waiting for you. The rough work has been done. The plans are ready-made. All you're asked to do is put them together; to spend time enough, and care enough on yourself and your work —just to try your level best.

Copyright by Herbert Kaufman

Autobiography of an Operator—City Exchange Experience

Ellen Burke Tells How the Cruelest, Crossest Subscribers of a Big City Exchange Were Converted—The Important Part Played by the Telephone Company's Commercial Department—Effect of the Transformation on the Operating Force

By George Lawrence Willman

After the forest fires had wiped out Sylvanville, there was nothing left for us to do but begin all over again. Lillian had always felt that her candle would be hidden under a bushel in a city with a population less than half a million. Probably it was for this reason that she did not feel as badly as I did when we took our last look at the smoldering ruins of good old Sylvanville.

Girls, if you live in a small town where there is just one main street; where you know everybody and everybody knows you, and where they call you by your first name, don't ever be silly enough to long for the bright lights of the white way. The lonesomest place on earth is right in the middle of a city, where there are a million people and not one of them to call you by name, or even care whether you have a name at all or not.

Lillian and I were lucky enough to get work the first day we struck the city. It was August and the telephone company was short of help. Until the regular operators began to get back from their summer vacations, even little greenhorns like us were able to convince the eagle-eyed chief operator that we knew something about operating.

Oh, but those first weeks made my heart ache for Sylvanville, and even Lillian, the lion-hearted, found times when her courage almost failed her. We would have given a week's pay just to have some one call us like they used to in old Sylvanville:

"Ellen, that you? Get me Cy Perkins. How are ye this mornin'?"

It may have been rural, but it was real friendship and, believe me, the kind of friendship they grow on the farm is like the farm cream compared with city skimmed milk!

Possibly the day will come when city people will begin to realize that the girl at "central" is a human being. And it is right here that this story begins.

Lillian French did more to convince the subscribers of one big city that "central" is human than all the advertising and write-ups the company ever did.

It was one morning in September. We had stood the terrible siege through the summer—those scorching hot days, when everybody's nerves are on edge and as brittle as a piece of glass. But the first of September, the weather cooled and we had relaxed in the blessed belief that our work from then on would be tinged with the zest of autumn.

Then, without warning, it grew sultry hot. It caught us unawares. Our nerves were unprepared and a telephone operator, with unprepared nerves, is not a "telephone operator."

During our two years with the telephone company Lillian had made a splendid record. There was a courteous, soothing quality in her voice which seemed to fairly hypnotize irritable people. Raw, worn nerves were soothed by its tones. But even with the most unreasonable ones Lillian was too sensible to lose her temper. I guess she understood human nature and sympathized with crippled tempers much the same as the rest of us sympathize with crippled limbs.

As a result, the telephone company had gathered together a choice set, or rather an unchoice set, of some of the worst subscribers in the main exchange, and placed them on Lillian's position. If a subscriber found fault with half a dozen operators, he usually wound up at Lillian's position, and be it said to the everlasting credit of Lillian, this usually had the desired effect.

"I Saw Lillian's Face Grow Red and Suddenly White."

But this fatal morning on the 16th of September, Lillian, like the rest of us, was caught unawares. Our long summer siege at the board had told, even on her steel-strung nerves.

"Ellen," she said on our way to the exchange, "this is going to be a terrible day for me. I feel as if I could fly. It is a shame for the weather man to send us a day like this without warning. Doesn't he know that telephone operators should have time to wrap up their nerves in tissue paper and send them to the cold storage plant?"

Even if I do say it, Lillian and I had a "stand in" with the chief operator, and she had consented to our having positions together at the "A" board in the main exchange where we worked, and Oh! it was worth worlds to have some one like Lillian near on those days when things seemed to go all wrong at the board. She was so calm, so unruffled, that it gave one courage just to look at her.

"There! Don't be a goose," she would say when a subscriber would get ugly, "the poor thing doesn't know any better. He never saw a switchboard and he thinks we haven't a thing to do but to spend our time watching his signal!"

Her hand would flash over to mine and give it a reassuring little squeeze and I would smile again—sometimes through tears.

But today, when we reached the board, it was my turn to be the comforter and it is wonderful how we can rise to occasions sometimes.

Lillian was as swiftly accurate and her voice as clear and sweet-toned as ever, but a glance showed me that her nerves were worn pretty thin.

You girls who operate big switchboards know how you spot

the lights in your answering bays—each light flashes out with a distinct and familiar personality.

"Two—six—O—four," is a snappy, cranky man who sounds worse than he really is.

"Five—one—three" is a "hurry-up" subscriber, who takes the receiver off the hook and wiggles it viciously while he yells,

"Lillian and I Were Lucky to Get Work."

"Hello! hello! hello!" When you answer, he snaps out his number and begins to wiggle the hook again the next instant until the subscriber answers. Traffic men, chief operators and telephone people by the dozen have reasoned with him, pleaded, explained and threatened, but all in vain.

Way up in the corner of Lillian's answering bay there was a line signal for Mrs. E. Payson Smith, a society leader, club woman and girl's welfare worker.

If you are a telephone operator you know how cruel and unjustly mean some women can be over the telephone. They appear to have absolutely no comprehension of what a telephone exchange is like. Whenever there is a mistake or a failure of service, they seem to imagine that it is due to the operator wilfully trying to annoy them.

Mrs. E. Payson Smith was usually cold, haughty and overbearing, but now and then she lapsed into frenzied, hysterical and apparently insane fits of rage. She never believed the operator when there was a report that "They don't answer," or "The line is busy." She insisted that she knew it was not so and she wanted them to get the number immediately. If this dear lady had been less prominent socially, the traffic officials would probably have long before taken drastic means to educate her—she was the cause of more good operators resigning than any other one thing on earth.

Lillian used to say that Mrs. E. Payson Smith had been handed to her either as a reward for good work or as a last resort for a hopeless case, she wasn't quite sure which.

I had made up my mind this morning that I was going to take care of Mrs. E. Payson Smith's telephone demands for the day, and I watched her line signal like a hawk, and every time she wished to call up a society friend I plugged in ahead of Lillian. Evidently the heat had had its effect on Mrs. E. Payson, for she was on the rampage with a vengeance, but I didn't mind her sarcasm so long as I saved Lillian. Just at the wrong time, however, my answering bay got full of lights. I was busy with both hands and Lillian shot into Mrs. Smith's line ahead of me.

Mrs. Smith did not give numbers plainly—she affected a society drawl which defied the transmitting power of the best telephone ever made and baffled the hearing of the keenest operator. Yet to ask Mrs. Smith to repeat usually called forth something like this:

"Such—ah—stupidity is perfectly exasperating—you know what I said perfectly. Please get me my number."

This time Lillian asked her to repeat and probably without the usual result, for I heard Lillian ask again, "What number, please?" And there was a clink to Lillian's tone like two sword blades coming together.

It was very busy and there were half a dozen lights waiting for Lillian's attention.

Then I saw Lillian's face grow red and suddenly white. Her eyes gleamed with anger and in a voice that brought two or three of us to attention like a pistol shot, she said to Mrs. E. Payson Smith:

"What you say is untrue, and it is cruel and cowardly. I don't have to listen to people who talk like you do! When you come to your senses and ask for your number like a lady, I will be glad to answer you."

And then she pulled out the plug, but the signal kept on flashing wickedly for attention. Then it went out, for Mrs. Smith had gone to a neighbor's and called up the traffic manager to make her complaint.

In ten minutes Lillian was instructed to report at the traffic superintendent's desk. Mrs. Smith reported that she had been cruelly insulted by an operator and she demanded her telephone removed and an apology from the telephone company.

The traffic superintendent was a good telephone man, but his ear was close to the earth and, when a prominent person stamped a foot, it sounded like an earthquake to him.

On this particular morning Lillian was in exactly the right frame of mind to convince such an official that she was a very dangerous young lady to have as an employe. I think Lillian was capable of giving the traffic superintendent a thoroughly accurate estimate of Mrs. E. Payson Smith, and she undoubtedly did. She probably looked the superintendent squarely in the eye while she did it, and very likely her voice was as clear and metallic as a silver bell, too.

Anyway, Lillian was promptly fired.

During the interview, however, Charles Kellen was present. "Charlie" Kellen was not a traffic man, but he was one of the "smoothest," cleverest, commercial men in the business and the traffic superintendent had sent for him as the best possible emissary to send to Mrs. Smith with the company's apology on a silver platter.

"Well, do you feel better?" asked Mr. Kellen, when Lillian left the room.

"My!" exclaimed the traffic superintendent, "we are lucky to get rid of her."

"Who, Mrs. E. Payson Smith?" Kellen asked, smilingly.

"This is nothing to joke about, Charlie. Mrs. Smith is one of the biggest club women in town and we certainly don't want to start anything with her."

"DeBaister, I think you are wrong in firing that girl."

"Wrong! Are you crazy?"

"I believe Mrs. E. Payson Smith has got your goat. You fired that operator for telling Mrs. E. Payson Smith only what you or I should have told her long ago. Of course, the operator shouldn't have taken it upon herself to do our job—but somebody had to do it sooner or later. I think I will go and see Mrs. Smith."

And before the traffic superintendent finished gasping, Charlie Kellen was out of the office and in his automobile on the way to Mrs. E. Payson Smith's.

Mrs. E. Payson Smith had yellow eyes with a green streak in them and when she eyed Kellen with her lorgnette, the pupils looked like long slits. She listened to his short, level-headed story, which, together with Lillian's few short words over the wire, was the first time she had ever heard the truth from the telephone company.

She ordered Kellen out of the house in a particulary nasty way, which was one of her artistic accomplishments and, to

see that her orders were carried out promptly, she summoned a butler, who was dressed in a lavender livery with brass buttons.

"The very idea of your daring to come into my house and insulting me the way you have! It is bad enough to have subscribers cruelly insulted over the line, by vulgar and impudent operators. It is unendurable, however, to think that a company will send a person of your stamp to a lady's house to talk to her the way you have talked to me this morning. From your remarks you wish to infer that I have not been perfectly ladylike in talking to your operators. I wonder that I have been as patient and as kind to them as I have. I shall certainly take this matter up with the ladies' clubs in this city and see what we can do towards having polite and decent girls hired by the telephone company. In the future I do not care to have people of your stamp come into my presence and, if you attempt it again, I shall call in the police for protection against your vulgarity. Leave my house instantly!"

Mrs. E. Payson Smith made a mistake when she told Charles Kellen that she was going to take the matter up with the clubs. That was the suggestion which gave him the idea that makes my writing of this little chapter of history, possible.

Mr. Kellen was a thoroughly competent commercial manager of a public service corporation. He was familiar with the city's social organizations, and therefore with the women's clubs and their quarrels.

For years Mrs. E. Payson Smith had domineered over the clubs, as she domineered, or tried to domineer over everything else. But this is an age of progress, and in the last year or two, the aggressive ladies of a growing city, had begun to throw off the shackles of Mrs. Smith's leadership. The town was getting too big for one woman to handle.

Mrs. George Perron was the insurgent leader. She was as

"Wiggles It Viciously While He Yells 'Hello! Hello! Hello!'"

different from Mrs. Smith as the queens of today are from the good old red-headed Queen Bess of long ago.

Mrs. Perron was a big-hearted, big-souled woman, with a big broad mind and a nerve and brain as steady as her level pair of steel-gray eyes. She was a leader of women, because she was, above all, womanly. She was not of the "suffragette" type, but she had the calm, dauntless courage of a good woman.

City councils, school boards, liquor organizations, and boards of directors, all had good cause to respect her fearless courage, limitless resourcefulness and masterful leadership. She was one of the few women who could assume leadership over women without inspiring envy or jealousy. When you can find a woman like this, you have found the only queen who has the right to reign in this age. She had cleaned up the school board, made it a misdemeanor to keep saloons open after eleven o'clock and made a lot of tight-fisted people give up large sums of real money to build public bath houses for the ctiy's poor, homes for working girls and lots of other real charities.

When Mrs. Smith said "women's clubs," Kellen thought of Mrs. Perron, and when he thought of her, an idea came into his mind which proved big enough to make a new world for all of us poor telephone operators.

"Mrs. Perron," he said, when he called at her house five minutes after leaving Mrs. Smith, "this is not an official call. Please forget that I am a telephone man."

"I am glad to see you Mr. Kellen, and don't be afraid to be official, for I am very much interested in the telephone company. I believe you have something like 1,200 girls working for you, haven't you?"

"Mrs. Perron, that is just what I came to see you about, I must confess; but I do not come as a mere official of the company. I come as one who believes that there is a great work to be done in this city in behalf of the telephone operator. And aside from my connection with the company, I am keenly and sympathetically interested in the telephone operator from a purely humanitarian standpoint."

"Mr. Kellen! I never knew you were such a fine orator. Pardon me for interrupting you."

"Well, isn't that the way you've got to talk to prominent women's club women to make them listen?"

"No, I'm afraid it isn't—you know club women are not supposed to listen to anything."

"Seriously, Mrs. Perron, you ladies can do a great work for twelve or fifteen hundred young women in this city, if you make up your mind to it. There is no class of working girls today who are less understood, or less appreciated, than the telephone operator."

"To begin with, Central is a real human being. She is a conscientious, capable young woman, who does her best to please everybody. Of course, now and then she fails, but she does not fail purposely and very seldom does she fail through neglect or carelessness. Most people, however, believe that she does, and I am afraid that some ladies think she tries to annoy them purposely by giving them the wrong number."

"I hope, Mr. Kellen, that I am not one of that kind."

"No, you are not, Mrs. Perron, because you have a faculty of being able to put yourself in the place of others and have sympathy enough to appreciate some of the things that an operator has to put up with. In order to do the operator justice, one must have at least a general idea of how calls are handled at central."

"Tell me, Mr. Kellen, why does an operator report the line 'busy' to me and then I find out later that the line wasn't busy at all?"

"There are a variety of possibilities, Mrs. Perron. First of all, understand that an operator can gain absolutely nothing by telling you the line is busy when it is not. She only makes more work for herself, because the chances are that you will repeat your request in a few minutes and she will have to do her work all over again. Of course your line is accessible to every operator in the exchange in order that any calling subscriber may be able to get you through his or her operator, but no operator has to listen on your line to find out whether it is in use or not.

"The test is made automatically by touching the tip of the connecting plug on the rim of the hole representing your line. If your line is in use, the operator will get a clicking sound which will be her signal that the line is busy. This clicking sound represents a certain mechanical condition. The mechanism may be out of order at any time, and so the oper-

"'Well! Do You Feel Better?' Asked Mr. Kellen."

ator may get the clicking sound when the line is not busy. In fact, a false busy test is not an uncommon result of line disorders.

"Of course, we admit that there is always the possibility that the operator may make a mistake; but, here is an important thing for you to remember Mrs. Perron, seven out of every ten calls that you make are to subscribers in some exchange outside of your own. In that case, two operators handle the call. The operator who answers your telephone and receives your number must transmit that number to an operator in the exchange you are calling. The operator in the distant exchange establishes the connection desired or reports 'line busy.' Countless times subscribers scold their answering operators for giving a false report, when seven times out of ten, even if there is an operating mistake, the failure is due to an operator in the distant exchange. So the subscriber is scolding the wrong girl and, according to the rules of the service, she must not answer back, or explain her side of the case."

"Why, Mr. Kellen, I am afraid I am guilty in this respect. I never knew that two operators were necessary to handle a call to another exchange."

"Did you ever stop to think, Mrs. Perron, how unreasonable we are in using the telephone? We are perfectly content to wait in line at the bank or at the ticket window at the theater; we wait patiently for waiters to serve us at the cafe. When we take the receiver off the telephone, however, we expect an instantaneous answer. As a matter of record, our operators answer calls at an average of less than three seconds; yet one of the most frequent causes of complaint is the slowness of Central to answer the telephone.

"Occasionally, the operator causes some of our subscribers to wait more than three seconds, possibly, in extreme cases, as much as 30 seconds, but a 30-second wait is almost sure to bring its complaint. Yet the duties of the operator in answering her subscribers are not unlike the duties of the man at the ticket window. Of course, an operator must answer more than one subscriber. There are times when half a dozen subscribers desire numbers at the same time and some of them have to wait, while the first ones are answered. These things cannot be helped.

"The whole trouble, Mrs. Perron, is that people have not enough imagination to realize—or probably I should say, visualize, the girl at the switchboard.

"Instead of forming a mental picture of a young woman, busily and conscientiously answering calls with nimble fingers, they seem to get a picture of a giggling, gum-chewing, careless girl, neglectful, possibly lazy.

"As a matter of fact, Mrs. Perron, you would be surprised to know how many ladies in this town imagine Central is a young woman sitting in a comfortable chair, eating candy or reading a book. This is not an exaggeration; it is an actual fact that they have no better conception of Central than that! You know some of you ladies," said Mr. Kellen with a smile, "have not a very comprehensive imagination when it comes to practical affairs."

"Why, in the name of common sense," asked Mrs. Perron, earnestly, "doesn't the telephone company tell its subscribers some of these things?"

"Ah, Mrs. Perron, that's just what I am getting at. The telephone company can tell its subscribers nothing convincingly simply because the company is an interested party. If we should attempt a discussion in print regarding the duties of the telephone girl, it would be accepted as advertising literature, written for the benefit of the company. The only way we can convince people is to bring them to our switchboards and actually show them the girls at work. We are very glad to do this, but, do you know?—it is extremely difficult to get our subscribers to visit central, and, especially those whom we are most anxious to get."

Charlie Kellen knew the telephone business from the ground up and he was thoroughly in sympathy with the trials and tribulations of the operator.

Mrs. Perron was probably one of the most intelligent subscribers that he had ever had a chance to talk to so earnestly, and as he progressed, he grew more and more enthusiastic. Mrs. Perron grew more and more interested and sympathetic. Finally, she grew so interested that she decided, then and there, to visit the telephone exchange, and at Kellen's suggestion she rode down in his car with him to the exchange.

(To be concluded.)

Bell Telephone Operators Have Reunion at Dayton.

Telephone operators from 88 Bell exchanges in the vicinity of Dayton, Ohio, recently attended a reunion at Dayton in response to invitations issued by the company. There were 108 girls present. Upon their arrival they were shown the construction and operation of the Dayton local and long distance offices, following which talks on various subjects of interest were delivered.

After assembling for a group photograph the guests were given a luncheon, and were then taken for an automobile tour of the residential and flood sections of the city. The ride ended at a local theatre where a wholesome vaudeville performance was witnessed and the day's program concluded with a shopping tour. The officials of the company believe that this "get-together" meeting will help to develop a spirit of fellowship and loyalty.

Paterson, N. J., Firms Without Telephone Service.

The New York Telephone Co. recently cut off telephone service from eight business houses of Paterson, N. J., when, after 15 days' notice of the abrogation of old-time contracts giving unlimited service at a flat rate, these houses refused to sign new contracts. In its notice the company cited a ruling of the Interstate Commerce Commission in regard to equalization of telephone rates as its reason for adopting the message rate plan.

District Manager M. J. Moloney, of the telephone company, in explanation of the company's action, stated the flat rate plan was not a uniformly fair one for the large community and that under it the subscriber who had but a slight use for telephone service paid as much as the subscriber whose use for the service was large, and that this actually meant that the small dealer was paying for a large part of the big fellow's service.

Our Unproductive Load

The Bankers' Convention—A Choice Group of Destructives

By J. C. Kelsey

"Who killed Cock Robin?"

"I," said the Sparrow, "with my bow and arrow, I killed Cock Robin."

Shall the bankers of the United States control the currency of the country or shall the government of the United States control it?

"We should!" "We should!" shouted the bankers, 2,000 of them, arrayed in their best Sunday clothes, shouted in unison, and they hooted and hissed, exactly as a bunch of rowdies in the gallery of a cheap theater.

It was a *free forum* for the full discussion of the subject. It was so free that every defender of the Currency Bill was rooted down.

Every opportunity was given to the assembled bankers to express their views, yet the few defenders were mercilessly howled down.

What has become of the dignity of the whiskered example, who sits back of the brass railing and advises our widows and orphans, and whose sage advice is so respectfully listened to by the weak and helpless?

Hoot and hiss! Hiss and hoot! A fine thing for exemplary gentlemen to do.

Only three beings hiss—a goose, a snake and a human being. Surely the world is turning around.

It is a fine revelation to learn that underneath the whiskers and the dignity are some of the characteristics of a human being. It is gratifying to know that even this sacred association can destroy as freely as a bunch of anarchists.

It is amusing to hear a resolution like this, commending "the President, the Secretary of the Treasury and Congress for their efforts to create in this country an elastic as well as a safe currency"; and in the same breath describing their efforts as "socialistic" and "imposing hardships upon the banks."

As a back-handed compliment, this takes the first prize.

Then the president began by characterizing the bill as "an interference with the liberty of citizens with their own property," and then he unfolded the American flag and made the eagle scream.

"This great country was born in the spirit of liberty and freedom from oppression."

There was great applause at this novel idea, and then we learned that the interests of the bankers and the public were coincident. More applause!

"When business is active and prosperous, the banker shares in the benefit; when it is languishing he feels the ill effects." And more applause!

"The chief function of the banker is to loan his capital and other resources to his customers."

I believe the chief function of bankers this year has been to butt into everybody's business.

Anyway they had a good time applauding until one man had courage to rise.

His name was McRae, and I take it he is a Scotchman.

He tried to defend the bill, and he protested against the insults to the president and to the public.

The supes attending, groaned and hissed—and they hooted and howled.

Really it is a poor way for these silly money changers to get anything done.

I have always heard that you could catch more flies with sugar, etc., but this noisy crowd of hissing, howling and hooting bankers think otherwise.

It seems to me that the bankers are literally forcing the adoption of the bill, instead of trying to get amendments.

If it were up to you or up to me, after all this disgraceful acting, we would put a currency bill through that would really hurt them.

The secret of the whole thing is the same as with the railroads and other utilities—they want to do their plundering in the same old way.

The invasion of the sacred rights theory is always the weapon of the wrongdoer when caught at it.

Not one man in that 2,000 was a producer; they were, to a man, non-producers—just like drones in a bee hive.

They toil not, neither do they spin, yet I say unto you, that Solomon, in all his glory, never had such a cinch as these whiskered hooters.

You must have confidence in them, but they have no confidence in you!

You must work, you must reap, but they want the fruits!

That is the size of it.

The behavior of the banking fraternity this year cannot be much different than that of the French noblemen before the revolution.

The public got tired of killing them—and it may be that the public will get tired of listening to these destructive tirades and go in the banking business themselves.

Never in the history of industry has a particular group of men revealed so much incompetency and selfishness. It is a sad give-away.

Children may yet throw mud at the banker's carriage and jeer him as the town clown.

The public has seen enough to do it.

Unproductive! It is a horrible word; it means loss and eventual ruin.

The best business on earth will be ruined when the unproductive expense gets too prominent a place on the scale.

The unproductive forces usually have the most nerve and impudence. Like a deadbeat, they demand the best, and knowing all the time that they will not pay for it.

Unproductive people not only demand the most, but do the most complaining.

I remember of collecting about $100 worth of "phoney" money in our telephone booths at Duluth. For the life of me I could not catch the offender, who evidently was using long distance service without cost.

One evening a fellow called me on the telephone and it is a wonder the wire stood it. He called me everything; cussed the service, and was outrageously unreasonable—but I found out he was calling someone in Milwaukee.

The next time he called Milwaukee, we sent him to a booth in which all the money had been removed from the coin collector. After he talked, the detectives approached and detained him while we opened the coin box.

In that box were three nice iron dollars, one iron half dollar and an iron quarter. In other words, we caught the un-

productive man, red-handed, because he was true to the instincts of that breed.

And so it is with the American Bankers' Association. They are complaining and making unreasonable demands.

Let them be careful that the public does not find iron money in the coin boxes.

It is human nature all over I guess. The productive man pays as he goes, and makes no complaints—the non-productive man pays nothing, and makes all the noise.

I once ran a league ball team. We played in a fair ground, and far off in left field was a wire fence.

Too many people got in the habit of watching the game from that open place, so I built a nice high fence.

From that time on, I was roasted alive and my team was unpopular, simply because I had shut off the graft of the unproductives. My gate receipts visibly increased however.

So it goes with the currency question. The government may find that banking is a profitable thing to undertake, by building a tight fence around the financial park and compelling the recalcitrant national bankers either to pay to get in, or to lose their charter.

It's 100 to 1 that every national bank will tumble head over heels into the scheme the very moment the bill becomes a law. Let's call a few bluffs anyway!

I think you will get the notion by and by that I am down on banks. Far from it! I am only down on bankers who hoot, hiss and howl when they can't run things their way.

I have a little stock in a national bank and enough to qualify me as director at the next annual meeting, and every one connected with the bank is more than willing for the bank to subscribe for its necessary share in the new federal reserve bank—not a single threat to withdraw either.

While this particular national bank is not a $100,000,000 bank, and does not loan money to brokers on call, it surely can be taken as a criterion, at least, that not all the banks are against the Currency Bill.

I know you are tired of hearing about banks, bankers and currency, but I think that a financial editor should be allowed to deal in finance occasionally.

I probably should stick closer to the telephone business, but I have seen so many Independent telephone men coming to Chicago to talk to brokers and bond dealers in regard to the financing of their plant, that I believe Independent telephone men are interested in arriving at a condition which would drive $2,000,000,000 back into legitimate industry and take it away from gambling.

This noon I happened to meet a financial man and as soon as he found out that I was interested in telephone matters, he started in to condole me about the death of the Independents, how the Bell had everything, etc. I said I would like to get an hour of his valuable (?) time—I thought I could enlighten him.

Somehow we send missionaries to China and other places. We need them here!

No financial man's time is valuable who has such a fund of mal-information as this man—yet he is a custodian of the funds of some widows, orphans and incompetents.

I have seen these financial giants sneer at a decent telephone earner, and then eagerly rush into an hydroelectric deal with a rotten dam, and one that could only pay bond interest when the luck was good. Yet these fellows sit up and tell you that the Bell company has everything.

You have never heard the Bell company's responsible officials say they had it all. If they ever get it all, they will be in the position of the man holding the enraged bull by the tail.

Yet I hear this financial man complaining about Chicago banks.

He said they had been holding back everything since spring trying to influence the Currency Bill; that you could borrow money only from a broker, a nephew of the bank's official, or a son, and pay 2½ per cent. commission.

Oh! He had a terrible kick coming.

So it looks to me that no one engaged in financial affairs is particularly happy. It seems a shame to try to add to their discomfort.

I believe I am happy to be in the Independent telephone business.

Our unproductive loading shows itself in high cost of living.

One man will produce an acre of onions; five men will distribute these onions and each man will make as much as the producer—and every one of the non-producers live better and work less than the producer.

A bushel of apples can be bought under the tree for 40 cents. You and I pay 40 to 70 cents a peck for them, simply because there are too many drones between the consumer and producer. And the tendency of drones is to increase too.

In almost every line, aside from food products, the jobber has been eliminated. In many ways, he is a non-producer, a drone, who creates nothing and yet lives upon the producer.

Jobbers and bankers are a great deal alike.

The jobbers have as much right to ask for the control of the products they deal in as the banks have to control money.

Merely handling it does in no wise merit control. Besides, the handlers of money in the average banks are more or less inferior in intellect and energy to their industrial brethren.

I dislike a cry baby—and I dislike cowards, who hiss and hoot and howl.

That describes the meeting of the American Bankers' Association to a tee.

They were insulting, not only to the president of the United States, but to the United States as well.

I think the president would go well into immortality if he had put Boston under martial law, and at sunrise gently shot the hissing mob 'neath the shadows of Bunker Hill.

It was right there, close to Bunker Hill, that the bankers and business men rushed to the seashore to stop the Boston Tea Party, because war with England would hurt business.

It was the producer who grabbed his gun, kissed his family good bye and rushed off to Lexington.

History indicates no drone as ever making a sacrifice of anything.

That is the sympathetic cord betwen gamblers and bankers—they have the same dronish characteristics. No wonder they are hand in hand against the producer.

It is human for birds of a feather to flock together. And it seems most human to despise the hand that lifts us up and the ladder that allows us to climb up on beyond the bitter necessities of life.

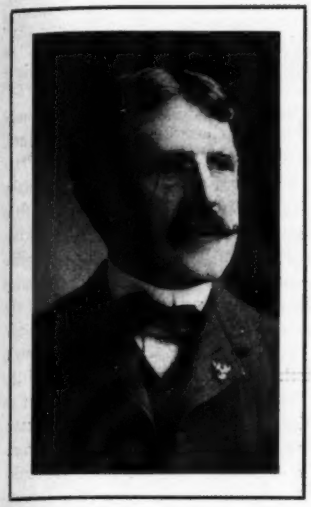
I am sorry that the 2,000 assembled bankers showed their fangs so plainly. They had the same spirit shown by the French princess: If the public can't find bread, why don't they eat cake?

The Bankers' Association will yet bow to the advancing strength of democracy. They will be lucky not to be crushed by it.

MORAL: He who won't see, is the blindest man.

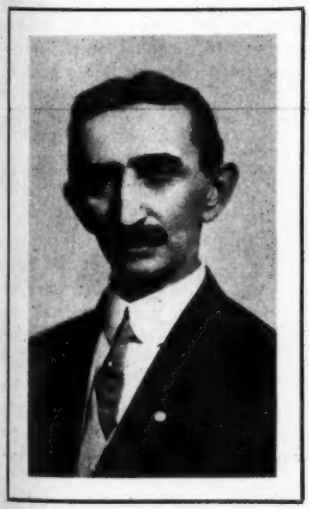
A Quartet of Men Prominent in the Telephone Field

WALTER E. DOOLITTLE was born in Lafayette, Ind., in 1862. He attended the Lafayette public schools and Purdue University. After leaving college he carried messages for the Western Union Telegraph Co., became operator and worked for the Western Union, Baltimore & Ohio, Atlantic & Pacific, American Union and Postal Telegraph companies as operator, wire chief, chief operator and manager at Chicago, Toledo, Evansville, Lafayette and other points. He was connected for a time with the Duluth & Iron Range Railroad, in Minnesota, and with the Northern Pacific in Montana, and has been interested in the cigar business, livery business and commercial school business. He was manager of the Cushman Telephone Co., at Lafayette, Ind., and from 1889 to 1895 was manager of the Central Union Telephone Co.'s Lafayette exchange. He became manager of the Lafayette Harrison Telephone Co. in 1890. In association with Frank B. Cook, he incorporated, in 1898, the Sterling Electric Co. at Chicago, later moving the factory to Lafayette, Ind. He left the telephone field in 1910 and is now president of the Universal Mausoleum Co., Chicago.



ARCHIE B. CONKLIN, for the past 4½ years vice-president and general manager of the Atlanta Telephone & Telegraph Co., Atlanta, Ga., was born at Salem Center, Steuben county, Ind., on July 11, 1866. He graduated from Wauseon, Ohio, public schools, and from the commercial department of the Northwestern Normal, of Wauseon. He engaged in the insurance business, and in 1895 became director and one of the builders of the Northwestern Ohio Telephone Co., Wauseon, Ohio. He has served as director of the Independent companies of Adrian, Mich., Washington Court House, Warren, Niles and Akron, Ohio, the Interstate Telephone & Telegraph Co., of Aurora, Ill., the Streator Independent Telephone & Telegraph Co., of Streator, Ill., and the People's Home Telephone Co., of Leavenworth, Kan. He was also manager of construction and treasurer of the latter three companies. From 1900 to 1905, as president of the Conklin Construction Co., he constructed $2,000,000 worth of property for the Interstate company of Aurora, Ill. Mr. Conklin is a member of the Capital City Club, of Atlanta, Ga.

CHAS. S. NORTON, secretary-treasurer of the Indianapolis Telephone Co. and the New Long Distance Telephone Co., of Indianapolis, Ind., was born at Columbus, Ind., on August 10, 1866, and was educated at DePauw University, Greencastle, Ind. In 1895 he became manager of the Citizens Telephone Co., of Columbus, Ind., then secretary - treasurer and finally president of that company. In 1899 he became superintendent of construction of the newly organized New Long Distance Telephone Co. and in 1909 secretary-treasurer of that company and of the Indianapolis Telephone Co. He is also secretary-treasurer of telephone companies at Martinsville, Franklin, Columbus, Lebanon, Covington and North Vernon, Ind. He was one of the organizers and first secretary-treasurer of the Indiana Independent Telephone Association from 1905 to 1908, and then he served as president for two years. He was a member of the advisory board of the International Independent Telephone Association and one of the organizers and president of the Toll Clearing Co. of Indiana from 1908 to 1911. Mr. Norton has written quite extensively on telephone subjects.



JOHN FRANKLIN TOMPKINS, general sales manager for Frank B. Cook, 326 West Madison street, Chicago, Ill., and the factory of which company is located at Zion City, Ill., was born at Columbus, Ind. and received his early education in the public schools. His first employment was that of clerk in a retail store, after which he worked up to the position of bookkeeper. He was then employed for four years as a hotel clerk, after which he engaged for four years in the merchant tailoring business. He began service with Frank B. Cook in 1896 when the latter was interested in the Sterling Electric Co., of Lafayette, Ind. Mr. Tompkins served as purchasing agent for the Sterling Electric Co. until 1901, at which time Mr. Cook sold his interests in the company and removed to Chicago to manufacture on his own account. Mr. Tompkins transferred his allegience to the new establishment in Chicago which has since become well known in the telephone field and where he is now general sales manager. Mr. Tompkins is a member of the Chicago Electric Club. He is an Elk and belongs to the Sons of the American Revolution.

Modernizing the Telephone Feeder and Distribution Plant

A Discussion of the Problems Confronting the Plant Engineer in Providing Proper Facilities for Maintaining Telephone Service Along Economical Lines in Cities of About 25,000 Population—Extension of the Underground System—Distribution Details

By Charles W. McKay

The problem of developing the telephone feeder and distributing plants to meet present needs and at the same time provide facilities for the immediate future is one that has claimed a large portion of the telephone engineer's attention during the past decade. Many of the larger Eastern companies have established plant engineering departments whose sole function is to deal with problems of this nature. It is estimated that this policy has saved these companies hundreds of thousands of dollars since its inauguration.

Early Plant Engineering Methods.

In the early days of the telephone, a pole line, tall enough to allow for the subsequent addition of an extra arm or two of wire, was considered sufficient provision for the future.

Many telephone companies in the United States still adhere to this primitive method of "engineering" and, as a result, their pole lines are covered with an unsightly mass of wires and cables, expensive to maintain and necessitating frequent costly duplications of plant to provide for new subscribers.

In the history of all plants of this type there comes a time when excessive cost of maintenance and complaints of poor service on the part of subscribers, necessitate drastic action. At this time the services of a trained plant engineer can do more to save the day than the combined efforts of the construction and operating forces.

It is the purpose of this paper to briefly outline the mode of procedure in a situation of this kind, assuming a hypothetical case of a town of 25,000 or 30,000 inhabitants, where the existing distributing and feeder plants are entirely the outcome of undirected growth, containing a minimum amount of subway and underground feeder cable.

To plan intelligently for the future it is necessary to carefully analyze the possibilities for growth in population. For this purpose a preliminary or "commercial" study is made, comprising a general survey of the natural resources of the town, such as water power and railway facilities, and of the opportunities for developing these resources.

Reference to census reports for the past 20 or 30 years, supplemented by personal observation of the real estate development, will give a fairly accurate conception of the growth tendencies and the variations in the rate of growth, i. e., whether past increases have been slow and regular; if conditions indicate a similar future growth; or, whether the development of water power or railway facilities has forced a rapid growth and warrants the assumption of its continuance.

Having investigated the character and future possibilities of the growth in population, the next step is to analyze its distribution over the town, determining the sections most rapidly developing at present and the sections most amenable to future development because of natural advantages or desirable transit facilities.

In conjunction with this general survey of the situation, a study should be made of the characteristics of the town from a telephonic standpoint. This can be most readily effected by making a detailed survey of the various residence and business sections, noting the character of the houses, as determined by rental and property values, the location of present subscribers, and the possibilities, from the standpoint of the contract agent, for increasing the number of subscribers. In making this latter study it is imperative that the engineer should keep in close touch with the business representatives of the company who are, or should be, thoroughly conversant with general local conditions and who may even know the individual possibilities of the non-subscribers.

With the aid of the data obtained during the preliminary investigation, a "theoretical" ultimate plant can be outlined, which will serve as a guide in making the final plans. Planning the "theoretical" plant involves a study of the topography of the town and will be facilitated by the use of a small field map upon which the preliminary data has been noted—especially the approximate location of present subscribers and possible new subscribers. The theoretical plant as plotted on this map should include the central office location, the designation of the most desirable streets for subways and aerial feeder cables, and the location of distributing pole lines and cables. The main points to be born in mind at this time are: the locating of the central office as near the "telephone" center of the town as possible; decision as to whether one central office will ultimately suffice to care for the entire town and if not where, approximately, the others should be located; the selection of feeder locations taking the shortest possible route from the central office to the sections they feed; and the arrangement of distributing pole lines and cables to facilitate short spans of wire to the subscribers' houses and to obviate duplications of pole lines.

In a town of the size under discussion, the existing subway is generally limited to the business section, probably extending a block or two either side of the central office.

Planning of the Subway System.

Assuming the present central office and subway of proper size and location, the consideration of the advisability of extending the subway system will be governed largely by the size of the feeder cables required to supply the outlying districts and by the nature of the pavements on streets where subway will ultimately be required. Generally speaking, it is inadvisable to place a feeder cable containing more than 200 pairs of wires, aerially. This is due both to the prohibitive cost of placing and splicing and to the unsightly appearance of larger aerial cables.

Conditions may arise, however, necessitating the placing of a feeder cable through an undeveloped section of the town to reach an area too populous to be adequately cared for by a 200-pair cable, but where 100 additional pairs would provide ample facilities for several years in advance. In this event it would prove more economical to place a 300 or even 400-pair aerial feeder than to build a subway. On the other hand, the immediate building of subway may be necessitated by other factors, such as the possibility of the laying of a new asphalt pavement or macadam pavement in the near future and the financial saving to be derived from installing subway in advance of paving. The possibility of city ordinances for removing pole lines from the main thoroughfares is also a determining factor.

The determination of the size and details of splicing of the feeder cables can be most readily decided after plans for the distributing plant have been completed.

The planning of the distributing plant in a town of moderate size and irregular topography, can usually be facilitated by dividing the town into sections and considering each section

as a unit. The location of the boundaries of these areas is primarily governed by natural barriers to telephonic distribution, such as water courses and high tension power lines, as well as by the size of the area it is advisable to care for from a given feeder cable. If this method is followed, the relation of each section to the adjoining sections and to the plant as a whole, must be clearly born in mind, especially in considering methods of relieving future congestion. The field map, showing the theoretical ultimate layout, will be a distinct aid in this connection, although actual conditions may warrant radical changes in the original, tentative plans.

The following points have to be considered in planning the distribution for the various sections:

1. Do the location and present condition of the existing pole lines, aerial cable and distributing wires, warrant their use in the new plant?

The solution of this question will involve detailed inspections of poles and distributing wires and tests of the conductivity and insulation of cables. It is cheaper in the long run to consign partially defective cable and wiring to the scrap heap than to patch them up for continued use. Poles, however, can often be reset to advantage, if the uppers are in good condition.

2. Selection of location for new poles.
3. Consideration of electric light conditions.

It is often possible to arrange with the local light company to occupy pole lines jointly, each company standing a proportion of the cost of building new and replacing old pole lines. In this event it is advisable to prepare specifications for joint use, providing definitely for the location of each company's interests on jointly used poles and covering all the contingencies of joint ownership.

4. Determination of size of new cables, location of terminals and methods of relief in case of future congestion.
5. Location of underground branches from subway to distributing pole lines.

The distribution in the residential sections is usually effected by placing aerial cables on alternate streets, parallel to the long side of the block when the width of the block does not exceed 250 feet. A block width of over 250 feet will necessitate excessive spans of wire to reach subscribers located on the intermediate streets. In cases of this kind, it will probably be necessary to place pole lines on every street.

In highly restricted residential districts public sentiment often prohibits the erection of highway poles. If private right of way can be secured, a sightly and efficient distribution can be effected by placing small aerial cables on short octagonal or selected round poles along the rear property lines.

The business section of a town presents the most complicated problem in distribution, due both to the growing tendency on the part of municipalities to prohibit the maintenance of highway poles on main business thoroughfares and to the large numbers of subscribers concentrated in comparatively small areas. The question can be effectively solved by placing distributing cables along the rear walls and fences of business blocks with branches into the cellars of the larger buildings and risers carried up through the light or elevator shafts to terminals located at convenient points in the hallways.

The determination of the size and splicing details of the feeder cables can be readily accomplished after the plans for the distributing plant have been completed. The cost of splicing the feeder cables is necessarily great because of the size of the cables, and care must be used to arrange the stubs, at the time of original installation, so as to obviate the necessity of re-opening the cables later.

The plans for both distributing and feeder plants can be drawn up on tracing cloth and any number of blue prints desired, made for the use of the construction and wiring forces.

The initial cost of the plant evolved by the modernizing of an antiquated plant of the type under discussion is necessarily greater than the cost of the original plant. It has been proved, however, that the saving effected in maintenance and the new business resultant from increased facilities and efficient service, will offset the additional investment in a comparatively short time.

Another factor worthy of consideration is the effect of a sightly plant and efficient service upon the general public, to whom a public service corporation is necessarily indebted for its existence.

The Transmission of Sound.

Every day dozens of people in New York talk with business associates or friends in faraway Chicago. Few know that it is not actually our friend's voice we hear when we use the telephone. It is merely an accurate reproduction of that voice faithfully copied, remembered, and repeated by that marvel, electricity, Donald Cameron Shafer states in the Sunday Magazine of the Chicago Record Herald in an article on "Sound That is Noiseless."

If the telephone was only a medium to transmit sound waves, it would be far indeed from the convenience it is now. Sound travels slowly when compared with electricity or light, as the speed of sound waves through the air is only 1,090 feet a second. It is 970 miles from New York to Chicago; therefore it would take a sound wave 4,700 seconds to travel the distance—supposing, of course, it was possible for sound to travel that far and be audible. This equals 78 minutes, or an hour and 18 minutes. Therefore, if you said "Hello!" in this end of a sound wave line, you would have to wait two hours and 36 minutes to get an answer from Chicago. At this rate of speed, if a man had much to say, he might better take a fast train and go to Chicago—not to mention what the tolls would be for ordinary conversation at the usual rates.

Without electricity it would be impossible to talk from New York City to Chicago or Denver, as we can very easily do today. Sound waves would not carry outside the great metropolis. What really happens is as follows: The voice causes a thin metal diaphragm in the telephone to vibrate in sympathy with the voice. This vibrating disk oscillates in front of a small magnet which sends little currents of electricity along the wires, that are in turn repeated to a similar magnet on the other end of the line. This second magnet, influenced by the electricity from the first diaphragm, causes the diaphragm in its receiver to vibrate just as the first one did, and of course in vibrating, it repeats in Chicago what was said to it in New York in exactly the same tone.

Electricity travels at a speed of 186,000 miles a second. This is so nearly instantaneous that it can be measured only with most delicate instruments. The time it takes electricity, carrying the human voice, to go from New York to Chicago is so infinitesimally small that it can hardly be recorded in comprehensive figures. Therefore, the modern telephone is nearly instantaneous.

The human voice is produced mechanically. Edison proved this when he made a machine out of wood, wax, and iron that would talk. Words are nothing but vibrations in the air produced by similar vibrations of cords in the larynx; therefore a common metal disk can be made to make these same vibrations and actually repeat the human voice.

The speaking tube is the only telephone that actually transmits sound waves in the air. Sound will also travel through metal, water, gases, and mostly any other solid or gaseous substances, and is greatly muffled by soft fibers, such as wool, coton, sawdust, dirt, etc.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery

By Paul Hamilton

"Now, boys," said Mr. Barrows. "We will put this instrument together again. The case is in fair shape. I see the wires for the batteries and transmitter are burned in the backboard. It is only necessary to examine them where they come through to find if they have been damaged by handling.

"The arrangement of running those wires direct to the

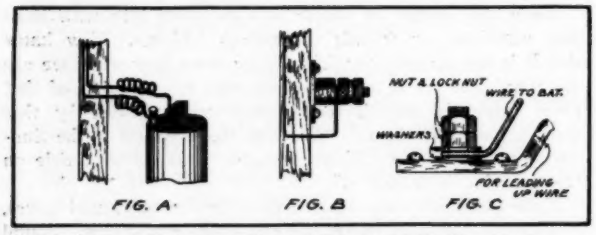


Fig. 15. Wiring to Cells and Details of Binding Posts.

battery (Fig. 15-*A*) is rather bad. Every time the cells are changed, the wires are given a slight bend at the point where they come through the backboard and will break sooner or later. The better way is to set a couple of binding posts (Fig. 15-*B*) and fasten the leading up wires permanently. I have a few here (Fig. 15-*C*) that are very good for the purpose, because there is one connection to be soldered and nuts and washers used for the other."

"The idea, I suppose, is to attach the battery wires under the washers, and never disturb the soldered connection?" Frank inquired.

"Not under the washers, but between them in all cases."

"Where shall we fasten the posts?" asked Germany.

"As near to the point where the wires come through the backboard as possible and yet not interfere with setting the cells in the pan."

"A little metal polish would help this transmitter," suggested Frank.

"No doubt, but use that dry powder, if it will answer the

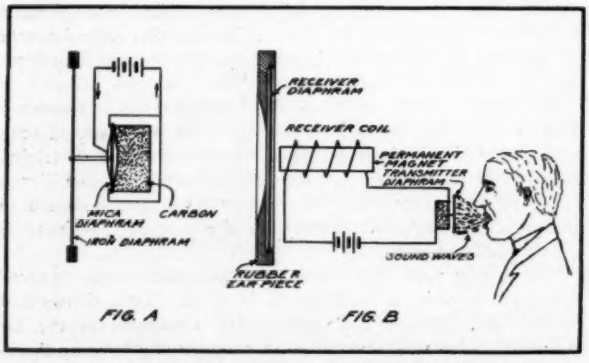


Fig. 16. Simple Transmitter and Receiver Circuits.

purpose. Water and transmitters are poor companions. When it is necessary to use the fluid polish, use it very sparingly," instructed Mr. Barrows.

"The transmitter is loose on the arm," Frank volunteered, continuing his examination. "The front piece will have to come off."

"If that is the case, take it apart for it is useless to overlook a loose screw. They never tighten themselves."

"Now, that I have this open, will you give me an idea of its operation? How does it produce sound?"

"Surely. It won't take a minute. In the first place, the transmitter does not produce sound, or reproduce it, either. It is nothing more nor less than an electric controller or rheostat, of a very delicate sort. Its action affects the flow of current on the line to an incomprehensibe fraction of a unit. The principle is something like this:

"You see I have a circuit (Fig. 16-*A*) for battery through the cell of carbon granules. By vibrating the iron diaphram with sound waves, the mica diaphram, directly connected to it, vibrates. This action first compresses and then releases the carbon so that the amount of current varies accordingly, as the resistance of the carbon is less when the granules are compressed and greater when they are loose. You see there is nothing in the nature of sound reproduced at the transmitter. Do I make it clear to you?"

"I think so," Frank replied, "but I'm going into all these things further."

"I might as well show you the connection of the receiver in the circuit. (Fig. 16-*B*.)

"Now we have the simple principle of the ringer coil that

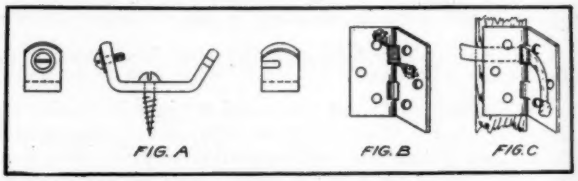


Fig. 17. Types of Line Wire Terminals and Hinge Connections.

I showed you a while ago, except in this case a permanent magnet is used. The current passing through the windings of the coil, affects the strength of this magnet, causing it to attract or repell the receiver diaphram in the same manner that the transmitter diaphram is vibrated by the sound waves. The action of this diaphram upon the air, reproduces the sound waves."

While he was talking, Mr. Barrows had been busy placing punchings in the apparatus box of the instrument.

"This style (Fig. 17-*A*) of punching," he said, "is quite suitable for this work, as the permanent wiring can be soldered to one end and the line and ground wires can be attached securely under the screw and washer at the other. One side of the bells and generator will be attached likewise, so that the circuits can be easily opened in case of trouble."

"In locating the punchings I have put them where they will be the most convenient to get at when the other apparatus is in place. I see the bell connections to the straps, were cut instead of being opened with the iron. It happens that there is slack enough in the tails from the coils to reach. Clean the old contacts with the iron, Mr. Dietz."

"I never have any luck soldering that fine wire," remarked Frank.

"There is one principle in soldering that must be invariably followed to insure a first class job," said Mr. Barrows. "Both of the parts to be soldered must be heated hot enough so that the solder will melt and adhere to them.

"Now, in this case, we have this tin strap which will require considerably more time to heat than the fine wire from the coil. Hence we will heat the strap first and allow some solder to accumulate on it. As the melted solder will heat the small wire almost instantly, we will remove the soldering iron and put the wire into the hot solder before it has time to cool. Fine wire or wire known as tinsel is difficult to solder because it burns so quickly."

"Will we continue to use the hinge connection between the door and the box?" Germany asked.

"It is a very good method," Mr. Barrows replied, "where the joint of the hinge is closed through. The spiral scheme (Fig. 17-*B*) is an improvement over the one (Fig. 17-*C*) on this instrument. The spiral spring in the hinge has two soldered connections."

"Some of our instruments have the spring hinges and on a great many, one connection or the other is broken," commented Frank.

"I presume these details appear as small things to you, but remember how many connections there are in one telephone circuit. Each little defect 'has a meaning all its own,' and

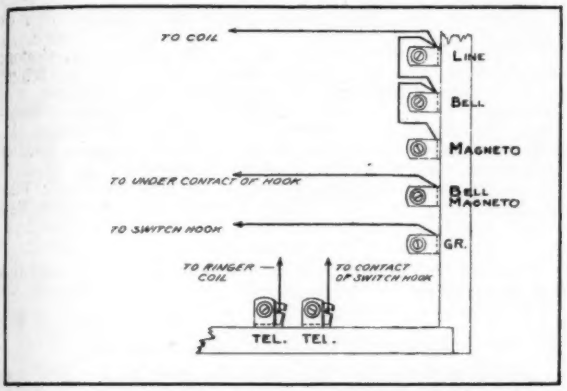


Fig. 18. Location of Punchings, or Terminals, in Bell Box.

adds its little mite to making the line noisy and ineffective in other ways.

"Now we will locate the punchings and permanently wire this case. I have made a sketch (Fig. 18) showing where the punchings are to be located and what is to be wired to them."

Nothing more was said for some moments while Germany worked over the case, mounting the punchings and replacing the parts, ready for connecting.

"Always cut your sleeving the same length as the wire you intend to use, then when the connections are made, it will fit snugly against the punchings and leave no bare wire exposed," were the next instructions given Germany. "Make your wire long enough to take an extra turn around the punching like this (Fig. 19-*A*). Then slide the sleeving close up to the post (Fig. 19-*B*).

"In soldering, only the end wrap need be soldered. Too much solder (Fig. 19-*C*) makes an unworkmanlike job. Another thing, with a clean joint and a clean, hot iron, it is more satisfactory to hold the iron against the punching (Fig. 19-*D*), until the punching itself will melt the solder."

"I see you have a pair of 'long noses,' also a pair of cutters," said Germany. "I had cutters once, but when I broke them, I got me a combination 'cutter and plier.'"

"As far as pliers are concerned, the combination pattern is all right, and in some cases it will answer for cutting purposes. But on this kind of work, you cannot reach the points to be trimmed, as you can with regular cutters.

"It's strange how customs change. For years and years, telephone wiremen used what are known as 'diagonals' (Fig. 20-*A*), and they are still used by some. Gradually it was discovered that jewelers were using a tool more suitable for our work.

"Here's a case in point: There is a wire end to be cut off in the side of this case. It cannot be reached with the cutting edge of your combination pliers, and there is not space enough to insert the diagonal type between the post

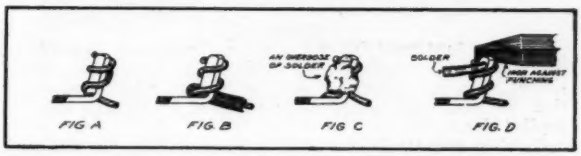


Fig. 19. Methods of Connecting and Soldering Instrument Wires.

and the magneto, but see! the Swedish type (Fig. 20-*B*) will do the job nicely."

"After I give this case another rub with polish and get some batteries, the set will be ready," said Frank. "It looks pretty nifty."

"Don't force the door shut. If it will not close easily, it is likely that a wire catches on the ringer," observed Mr. Barrows, noticing that the door closed with difficulty.

"I guess we will have to raise this punching," Germany remarked, after carefully looking over the set. "The ringer strikes it."

"All right. When you have done that, measure the distance from the top of the case to each punching. On any others needing rewiring, we will not make the same mistake."

(*To be continued.*)

Tacks and Nails as Linemen's Hazards.

There is a great need in most states of an amendment to the criminal code making it an offense to drive nails or tacks in poles which men have to climb, declared Mr. John B. Fisken, superintendent of light and power for the Washington Water Power Co., Spokane, Wash., in an address before the recent Northwest Electric Association convention at Seattle, says The Electrical World. Many a man, he added, has been injured by coming in contact with a rusty tack or nail sticking out from a pole. Sometimes tacks are used with heads ½ in. in diameter. If a lineman should happen to strike one of these with his spur, it would very likely cause him to fall. The city of Spokane has an ordinance making it an offense to tack signs on a pole, although it has not always been enforced.

Motor Trucks Dispatched by Telephone.

A telephone dispatching system to direct automobile trucks used in interfactory deliveries has recently been installed by a large automobile manufacturing company, says a writer in Popular Mechanics. Most of the deliveries

Fig. 20. Unsuitable and Suitable Types of Diagonal Pliers.

between the company's various factories are made by 22 motor trucks and 10 horse-drawn vehicles in the streets. To get the greatest amount of service from them, the company has put them in charge of one dispatcher, who directs them from one loading station to another by telephone. The dispatching system has been found to effect a considerable annual saving.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

CALIFORNIA.

October 5: Complaint by Pacific Telephone Herald Co. that Pacific Telephone & Telegraph Co. has discontinued leasing certain wires to complainant and desires that the telephone company be required to furnish wires as applied for.

October 10: Decision reducing rates of Pacific Telephone & Telegraph Co. in San Jose.

GEORGIA.

October 14: Hearing begun on application of city of Columbus for regulation of the rates of the Southern Bell Telephone & Telegraph Co., which recently advanced its rates 50 cents a month under an alleged agreement with the city to advance rates automatically when it had secured 2,500 new subscribers. The company, it is said, will be required to submit a statement of the actual cost of its plant, operating expenses and other data.

INDIANA.

October 6: Petition by Cumberland Telephone & Telegraph Co. for permission to make its rates uniform.

MISSOURI.

October 7: Settlement agreement reached in case of city of Joplin vs. Joplin Home Telephone Co., Missouri & Kansas Telephone Co. and American Telephone & Telegraph Co., whereby the two plants will be merged in Joplin. Schedule of rates approved by commission.

October 20: Hearing reset from May 2 in case of L. M. Dunlap et al., citizens of the Fairmont suburban district, complainant, vs. Missouri & Kansas Telephone Co.: Increase in telephone rental and tolls.

October 20: Hearing reset from May 2 in case of C. A. Lester et al., citizens of the Mt. Washington suburban district, complainant, vs. the Missouri & Kansas Telephone Co.: Increase in telephone rental and tolls.

October 20: Hearing reset from May 2 in case of the City of Independence, complainant, vs. the Missouri & Kansas Telephone Co.: Increase in telephone rental and tolls.

October 22: Hearing reset from May 2 in case of the City of Independence, complainant, vs. Home Telephone Co., defendant: Increase in telephone rental and tolls.

October 22: Hearing reset from May 29 in case of Weaver et al. vs. Kansas City Long Distance Telephone Co.: Increase in rates.

October 22: Hearing reset from May in case of E. S. Atkinson et al. vs. Missouri & Kansas Telephone Co.: Increase in telephone rates.

December 4: Hearing reset from August 26 in case of J. Ben Sims vs. Columbia Telephone Co.: Rates and service.

MONTANA.

October 21: Hearing at Kalispell on complaint of East Side Telephone Co. of Kalispell against the Northern Idaho & Montana Power Co.

October 23: Hearing at Hamilton on commission's own motion respecting reasonableness of rates of Mountain State and Independent telephone companies.

NEW JERSEY.

November 14: Hearing on application of Metropolitan Telephone & Telegraph Co. to compel New York Telephone Co. to grant service connections, which the latter company declined to make on the ground that the name of the petitioning company was the same as one of the pioneer subsidiaries of the New York company. The board first gave a hearing on the application on September 12.

OHIO.

October 2: Permission granted the Barlow-Watertown Telephone Co. to buy the plant of the Beverly Telephone Co., at Beverly, Washington County, for $1,000.

October 2: Hearing held on complaint of city of Lancaster against the Central Union Telephone Co. on account of an increase in rates for business service. The commission's examiner will appraise the property and investigate the company's records as a check on appraisal submitted by the company.

OKLAHOMA.

October 11: Petition filed by Merchants' Association of Durant asking that the service rates for business telephones in Durant be lowered from $2.50 to $2 per month; residence telephones from $1.50 to $1 and extension telephones from 75 to 50 cents per month.

SOUTH DAKOTA.

Date not fixed: Hearing on complaint from Highmore as to telephone service in which the Hyde County Telephone Co. is defendant, and on application of Hyde County Telephone Co. for an increase in telephone rental rates. Depositions have been taken and hearing will be fixed as soon as inventory of plant has been filed.

Date not fixed: Hearing on petition of Northwestern Telephone Exchange Co. for increase in telephone rental rates at Sioux Falls with consolidation of New State Telephone Co. and the Northwestern Telephone Exchange Co. One hearing has been held and final hearing will be held as soon as company has filed inventory and other information required by commission.

November 18: Hearing at Pierre on complaint filed on April 25, 1913, in the case of the Worthington Electric Co., Worthington; Groton-Ferney Mutual Telephone Co., Groton; Conde Telephone Co., Conde; White Telephone Co., White; Grant County Telephone Co., Milbank; Rural Telephone Co., Sherman; Moody County Telephone Co., Flandreau; Beresford Telephone Co., Beresford; Steninger Telephone Co., Parker; Canton Cooperative Telephone Co., Canton; Redfield Telephone Co., Redfield; Hudson Telephone Co., Hudson; plaintiffs, versus the Dakota Central Co., the Nebraska Telephone Co., the Missouri Valley Telephone Co., and the New State Telephone Co., defendants.

WISCONSIN.

October 13: Hearing held at La Crosse on the question of apportioning toll rates between Wisconsin Telephone Co. and La Crosse Telephone Co.

Petition to Prevent Cleveland Merger.

H. B. McGraw, of Cleveland, has filed a petition with the Public Utilities Commission of Ohio asking that body to check proposed mergers of Independent companies with the Bell system. The petition is based directly on the plans for a merger of the properties in Cleveland. The petition further asks that the pretended sale of the control of the Cuyahoga Telephone Co. to the J. P. Morgan Co. be declared fictitious and that control of the property be ordered returned to the Ohio owners so that the Cleveland situation may be handled by the people of Cleveland in the interest of the investment and for the advantage of the public.

Mr. McGraw acted four years ago as attorney for the minority stockholders of the Cuyahoga and Independent long distance companies in the attempt then made to prevent a consolidation. It is said that the filing of Mr. McGraw's present complaint makes possible the proposed investigation by the Public Utilities Commission, which Commissioner E. W. Doty declares was impossible under the recent resolution of the city council.

Work of Ohio Tax Commission.

The Ohio Tax Commission has been busily engaged in making investigations incident to the fixing of tentative taxation valuations for 1913. The comparatively small number of complaints from telephone companies is taken as indicating that the companies are satisfied that the commission has established a substantial and equitable basis of taxation. There have been enough hearings, however, to keep the commission busy. A number of valuations have been fixed finally and turned over to the accounting force for distribution to the taxing districts, but no announcement of these will be made until all are completed.

This week the commission has been hearing the larger companies of the state. Last week a good deal of discussion grew out of the decision of the commission to assess the property of small mutual companies, having no switchboard, against the company that does the switching. Naturally the switching company desires in some manner to get back the amount of taxes it will pay for the property which is really owned by the smaller company and the commission has been frequently asked how this can be done. That, however, is declared to be a matter between the switching company and the company it switches. The commission is ruling that the company that does the switching for the smaller company is operating the utility and, according to law, should be charged with the tax on the property operated. The larger companies are left to work this problem out with the smaller companies as best they can. The amounts in most instances will be small.

Seeks to Enjoin Mutual Company.

Attorneys for the Morrow County Telephone Co., of Mt. Gilead, Ohio, have filed a petition in the common pleas court asking that the Marengo Mutual Telephone Co. be perpetually enjoined from erecting its poles and wires and installing a competing exchange in Marengo. It is contended that the mutual company is proceeding without a franchise from the village or certificate from the Public Utilities Commission.

Merger Agreed Upon as Settlement of Joplin, Mo., Case.

The Missouri Public Service Commission last week approved a merger agreement between the Joplin Home Telephone Co. and the Missouri & Kansas (Bell) Telephone Co., and upon the agreement and request of all parties ordered a settlement on this basis of the case of the city of Joplin against the foregoing two companies and the American Telephone & Telegraph Co.

The agreement which is the basis for the commission's order of settlement contains the following provisions: That the Joplin Home Telephone Co. and the Missouri & Kansas Telephone Co. shall unite their respective plants in Joplin into a single system of universal service; that the combined system shall be operated by either system by agreement; that either may purchase the other's property on terms they may agree upon; that neither shall issue any new stock without approval of the commission; that for a period of six months from November 1, 1913, until such consolidation, the rates of the Missouri & Kansas Telephone Co. shall remain unchanged; that the rates of the Joplin Home Telephone Co. shall be as follows: Residence special line $2 a month, residence four-party line $1.50 a month, business special line $2 a month, business party line $1.75 a month, desk set 50 cents additional, no change in suburban rates.

After consolidation and until January 1, 1915, it is provided that the rates shall be as follows: Business special $2.50 a month, business four-party $2 a month, residence special $2 a month, residence four-party $1.50 a month; other rates as before.

Opposition to Rate Reduction in Vermont.

Governor Fletcher of Vermont was one of the spectators at the recent telephone rate hearing before the Public Service Commission at Montpelier and heard some adverse criticism of his rate reduction schedule. Among the witnesses examined were Ernest A. English, of Hartland, who said he was waiting for some one to come along and buy him out, and J. Ralph Pierce, of Fairlee, who was of the opinion it meant insolvency for his company if the commission's schedule became effective. Another witness wept when telling of his struggle to make both ends meet in the telephone business.

All testified there was no compulsion as to where and from whom they should purchase telephone instruments and supplies. E. B. Mevill, of the Heath Telephone Co., of Heath, Mass., opposed the rate changes and was on the stand all the afternoon.

Hearing in Case at La Crosse, Wis.

The Wisconsin Railroad Commission, by Chairman John H. Roemer, conducted a hearing at La Crosse this week on the question of apportioning the toll rates between the Wisconsin Telephone Co. and the La Crosse Telephone Co., under the order of the commission requiring physical connection of toll lines of the two corporations in that city. Frank Winter, the La Crosse attorney who filed the petition which resulted in the issuance of the order by the state board examined a number of employes of both companies, adducing testimony to show the extent of the toll line business done by each and the exchange cost of handling these calls. Attorney E. S. Mack, of Milwaukee, representing the Wisconsin Telephone Co.; George H. Gordon, of La Crosse, for the La Crosse Telephone Co., and L. G. Richardson of Chicago, appearing for the American Telegraph & Telephone Co., assisted in conducting the hearing.

Attorney Winter asserted that the toll rates out of La Crosse are large, especially so for short distances, and are so large that the Bell and Independent companies can afford to divide the receipts under physical connection. The Bell company has already appealed from the order of the commission to the circuit court of Dane county. From there the matter will undoubtedly go to the supreme court.

Commissioner Roemer impressed upon all parties interested in the matter that any schedule of rates ordered by the commission would be but tentative and subject to notification upon application of either the Bell or Independent companies.

Case Against Michigan Commission to be Heard.

The case brought about a year ago in the Eaton county circuit court at Charlotte, Mich., by the Vermontville Farmers Independent Telephone Co. against the Michigan Railroad Commission will come up for hearing, it is said, this month. The complaint is based on the refusal of the commission to permit the company to establish an exchange at Vermontville and to pay therefor out of the proceeds of a sale of stock which had been authorized by the commission, the commission's ground for refusal being that Vermontville was already adequately served by the Citizens Telephone Co., of Grand Rapids, and the Michigan State Telephone Co. It is stated that the case is likely to be taken to the highest court.

California Commission Reduces San Jose Rates.

A decision has been issued by the California Railroad Commission granting a reduction in telephone rates in the case brought by the city of San Jose against the Pacific Telephone & Telegraph Co. The reduction amounts to 50 cents for service which now costs $3 or more and 25 cents for service, the present rates for which are under $3. It is estimated that the new rates will reduce telephone income, on the present basis of traffic, $15,000 a year.

The commission criticized the practice of the company in requiring advance deposits for telephone service and ordered its discontinuance. The custom is characterized as a discrimination against the poor patron.

The payments of the Pacific Telephone & Telegraph Co. to the American Telephone & Telegraph Co., which controls the majority of stock of the former company, will be cut in half by a further clause in the decision. The commission found that the payment of 4½ per cent. of the gross revenue to the parent company was "merely a device for diverting excessive

dividends from earnings," and ordered that the Pacific Telephone & Telegraph Co. pay to the parent concern no more than a proper remuneration for service performed.

In commenting on the relationship of the two companies, the decision says:

"The stockholders of the American Telephone & Telegraph Co. and the Pacific Telephone & Telegraph Co. being the same, it is of course to the interest of such stockholders to divert as much money as possible into funds that may be used as dividends in excess of the amount which may be lawfully earned. Because of this situation, it is the duty of this commission to limit the amount which shall be a charge for service rendered by the American company to the lowest fair value."

Bond Issue of Pacific Company.

Henry T. Scott, chairman of the board of directors of the Pacific Telephone & Telegraph Co., recently confirmed the report that the company had sold $3,000,000 first mortgage and collateral trust 5 per cent. bonds to Lee, Higginson & Co., of Boston, subject to the approval of the issue by the California Railroad Commission.

The company proposes to use approximately $1,850,000 of these bonds for the purpose of retiring a like amount of underlying bonds of the Sunset Telephone & Telegraph Co. The remainder of the amount, $1,150,000, is to be devoted to improvements over the telephone company's system, including additional switchboard, conduit and line facilities in the cities of San Francisco, Los Angeles, San Diego and Oakland. The improvements also provide for new cables and telephone installations. One item provides for connecting 18,000 additional stations throughout the system at an expense of $306,000.

Decision Against Local License Tax in California.

The California Supreme Court has decided that a tax or license fee of $25 per quarter fixed by local supervisors years ago and levied against the Pacific Telephone & Telegraph Co. is unconstitutional.

Kansas Commissioner Favors Municipal Ownership.

Chairman Henderson Martin, of the Kansas Public Utilities Commission, favors municipal ownership of telephone systems, light and water plants and other utilities and proposed this remedy recently to the city officials and citizens of Ottawa, who had appealed to the commission for an order requiring the Missouri & Kansas Telephone Co. to improve its service.

Ottawa is served by both Bell and Independent systems. The franchise of the former has expired while the franchise of the latter company has six years to run. A. P. Elder, chairman of the retail Merchants Association, and Mayor A. H. Slater are reported in favor of the municipal ownership proposal.

The Public Utilities Commission employed J. H. Close, who has made a study of all kinds of municipal plants and the services of Dr. Close, it has been stated, can be obtained by any city which desires to try the proposition.

Lafayette, Ind., to Test Legality of Penalty Charge.

The city council of Lafayette, Ind., has taken action to bring suit against the Lafayette Telephone Co., of Lafayette, Ind., to determine whether the company is violating the terms of its franchise and thereby incurring the penalty of forfeiture of its grant by a new rule by which a 10 per cent. penalty is charged for failure to pay monthly or quarterly bills before the end of the month or quarter.

Telephone Company Mulcted at Newport, Ind.

Judge Buten, of Newport, Ind., has imposed a fine of $50 a day on the Citizens Mutual Telephone Co., of Newport, for each day, Sunday excepted, since June 25th last for alleged failure to place its wires underground as provided in a city ordinance. Judge Buten anounced that in lieu of any tangible property belonging to the company steps will be resorted to to collect the fines by securing money collected from slot telephones when weekly collections are made by the company.

Public Offices Granted Lower Than Business Rates.

The Public Utilities Commisison of Indiana has held that a cheaper rate should obtain for telephones in city, county and state public offices than for business telephones. This decision was reached as a result of the request of Phillip Zoercher, reporter of the Indiana Supreme Court, that the commission investigate an increase by the Central Union Telephone Co. from $40 to $54 a year for each telephone in the state house at Indianapolis. The commission has requested the telephone company to file with the commission a new schedule of rates for all city, county and state offices in Marion county. An increased rate cannot now be charged except on grant by the commission after a hearing.

Annual Report of Western Union Telegraph Co.

Theodore N. Vail, president of the Western Union Telegraph Co. has just issued the annual report of that company for the year ending June 30, 1913. Hereafter the report will cover the period from January 1, to December 31 of each year. The next report will therefore be submitted at the annual meeting of the stockholders in April, 1914.

The total earnings of the company for the year ending June 30 last amounted to $46,385,993, an increase of $4,700,000 over the previous year. Operating expenses, including rent of leased lines, reconstruction, repairs, miscellaneous interest, etc., amounted to $41,939,934 and taxes to $1,020,000. The increases over the preceding year for reconstruction and depreciation amounted to $1,652,800. Improvements at offices, relief department and pensions, etc., raised this sum to $2,342,000, while wages were increased $2,488,000, a total increase of $4,830,200 over last year.

The net profits of the company, including income from loans and investments and rentals from real estate, of $1,037,449, amounted to $4,463,509. The amount transferred to surplus account after payment of interest on bonds, $1,337,229, and dividends on stock, $2,992,166, was $134,113.

On its balance sheet the company shows a property account of $138,071,017; securities owned $18,241,461; materials and supplies $2,570,670; and current assets of $9,414,483—a total of $168,297,632. On the liability side the capital stock issued is shown to be $99,817,100 and stock held in treasury $30,341. Capital stock in subsidiary companies is $3,881,075 and the funded debt $32,602,000, making the total capital liabilities $136,269,833. To the current liabilities of $4,364,132, and deferred non-interesting bearing liabilities of $12,889,183, the company adds as liabilities, reserves of $5,241,856 as follows: For maintenance of cables $1,712,168—an increase of $127,087 over last year; for reconstruction of land lines, $2,186,896—an increase of $776,914 over last year despite the heavy expenditures for rebuilding portions of the property; for employes' benefit fund $1,028,529 and for other purposes $312,262. The total surplus in the last annual report was $10,726,086.

On January 1 the company will put into operation a new plan for the payment of pensions, accident and sickness benefits and life insurance and has charged to surplus and set up as a fund the sum of $1,000,000 for this purpose, the fund to be safeguarded by crediting the reserve with four per cent. per annum of the unexpended balance of the fund and by yearly additions not in excess of four per cent. of the company's payroll.

Practical Subjects—Letters and Discussions

Legibility in Toll and Measured Service Tickets.

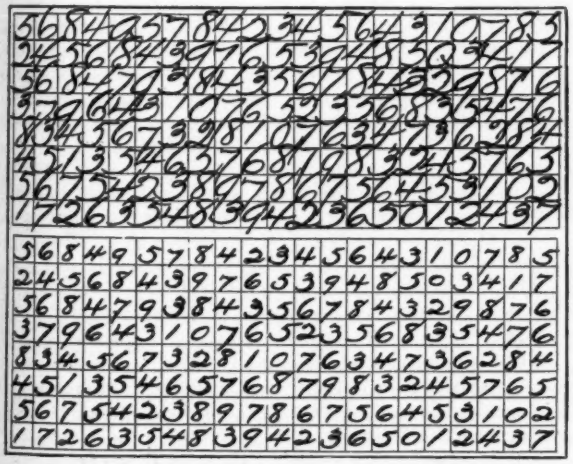
A vigorous campaign is being waged in the Boston division traffic department toward improving the handwriting and figures on toll and measured service tickets, and the effect of this campaign is being felt and appreciated all along the line through the accounting and commercial departments says the New England Telephone Topics. By means of illustrated talks direct to the operating forces in each traffic district, all employes who make or check these tickets are taught the damage to the company's reputation and revenue that can occur through carelessly made, illegible figures or letters upon these tickets.

The good work that is being performed in the Boston division by the campaign can be extended to other divisions throughout the company, and a few extracts from these talks are given below, as suggestions of the line of action to be taken:

The operator is the central figure in securing the company's revenue. While it is her duty to see that the subscriber gets the service that he desires, her whole duty is not yet completed. She must also see that the company's interests are protected by taking the necessary steps to secure the subscriber's payment for the service performed. One of the most important of these necessary steps is to see that the call is so recorded on the ticket that employes in other departments who handle these tickets may handle them readily and correctly.

Every illegible figure, every carelessly written name, or ring designation on a ticket means that additional and unnecessary work must be performed by somebody in the accounting department in deciphering it or straightening the matter out. The most important feature of all, and the one that should be brought straight home to every operator, supervisor, ticket examiner, and chief operator, is that the result of the operator's inefficient ticket work extends in 50 per cent. of the errors directly to the subscriber, and the company's reputation suffers in consequence.

A great deal has been said and written about co-operation, but before we can co-operate we must know what direct



Advantages of Clear Small Figures Over Large Flourishing Ones.

relation our work has to the work of other departments. We must know how the quality of our service directly affects the employe who next handles our finished product.

Consider for a moment the hundreds of clerks and typists in the accounting department who are making up subscribers' toll bills directly from the operators' tickets.. How much guessing are they doing at operators' hurriedly made sevens that look like nines, zeros that look like sixes, and quirks and flourishes that extend from one digit to another, entirely changing their complexion?

Do chief operators and supervisors ever visit the accounting department in order to determine how accounting clerks' burdens may be lightened by having the tickets so clear and legible that there would be no necessity for their guessing at line numbers, ring designations, and names of exchanges or persons?

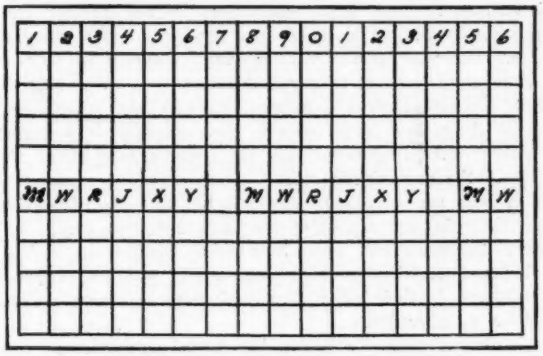


Chart Used in Teaching the Palmer Method.

Cases of illegible figures are found in measured service ticket work. Frequent causes of error in charging subscribers are traceable to large and hurriedly made figures. Let us take for example an operator who in writing the number 1451 continually extending the top of the 5, connecting it to the top of the figure 1, making a fairly good figure 7 out of the 1. The account of 1,457 is therefore not only charged with its own calls, but also with those properly belonging to 1451.

Such errors are our most difficult ones to trace, necessitating the inspection of hundreds of position tickets. It is readily apparent that subscriber 1457 "says a few things" when he is charged with calls that do not belong to him. He disputes the charge, and after an investigation by the commercial and traffic departments, the error is perhaps discovered and an agent is sent to explain. Such explanations rarely satisfy the subscriber, and they are far-reaching in their effect because he loses faith in our accounting and doubts our records for some time afterward. Nor does the difficulty for which the operator is responsible end here. The investigation developed the fact that the calls properly belonged to 1451, and on, that subscriber's next notice of the standing of his account, he is debited with the calls which should have been charged to him a month or two before. He immediately disputes the charges, and another explanation and another dissatisfied subscriber are the result, and all on account of a little thoughtless, hurried work.

On the chart of business figures of which the accompanying illustration forms a part, displayed in all exchanges, the following instructions are printed:

Nothing is more important to the operator than good figures. The first requisite is legibility, and its importance cannot be emphasized too much. Letters in a word may be known by the context, but each figure must depend upon itself for legibility. It is very important, then, that each figure should be so formed that its value, in groups or by itself, cannot be mistaken. Figures should be made small; operators sometimes think that large figures are necessarily plainer, but such is not the case. Examine carefully the diagram. The upper figures are absolutely plain; one could not be mistaken for another, and yet their extreme size in the space makes it difficult to

read. Beneath are the same figures, no more perfect, but not so large. Please note carefully that these, surrounded by white paper, and much smaller, are more legible, even at a distance, than the large figures.

Another type of ticket error which is causing considerable dissatisfaction among subscribers, and for which operators are directly responsible, is due to poor and illegible handwriting and spelling names of calling patrons.

Subscribers frequently fail to recognize the names on their toll bills as those of their employes. We have had several written requests from subscribers to use greater care in spelling names. One subscriber produced a bill showing the same name spelled five different ways. Another bill showed the same name spelled in seven different ways, viz., Russell, Annill, Easwell, Amswell, Ainsley, Amwell and Angell, and none of the tickets were correct. Investigation showed that the tickets were responsible, not the typist copying from the tickets to the subscriber's bill.

Such bills are invariably disputed by the subscribers, because they do not recognize the calls and this means expense to the company. These bills are all handled as "claims" by the commercial department, and much time and expense are involved in their adjustment and many of them are rebated as uncollectible.

It is always easy to criticise, but not always quite as easy to suggest a remedy. Dealing with the general subject of inefficient ticket work, we must certainly begin at the beginning, or with the operator, in applying the remedy. First, we should teach the student force, the value of accuracy in ticket work. Then we should place upon positions requiring ticket work, only those operators who write legibly, instructing them carefully as to the far-reaching results of poor work. Show them by comparison the value of small figures and of placing them in the center of the spaces instead of filling up the entire space.

There is no extra time involved in doing this ,and the results from it are excellent, as will be readily seen by the accompanying chart which is a facsimile of one in the Palmer method of penmanship, which is being taught in the public schools of Boston and the surrounding cities.

These charts have been placed in all exchanges, and weekly talks on ticket work are being given by chief operators to all of the operating force. The operators are also provided for that purpose which have the small Palmer method digits at the top of each form.

Operators sign their names to these slips and they are used for comparison with their actual work on the tickets.

Special lectures on the value of legibility in hand-writing and figures are given at the school for operators, the charts composed of enlarged tickets giving examples of good work and poor work are used to demonstrate the value of the Palmer method in ticket work. The special forms for practice in making the small figures referred to, originated with the Boston school for operators.

Supervisors should understand it is an important part of their duties to see that the operators make clear, legible, small-sized figures, well within the spaces on the tickets, not by calling their attention to it once in three months, but by driving it home at all times, and by knowing that they are producing results.

Storage Batteries—Indications of Trouble.

In the operation of storage batteries there are many cases where close observation and inspection of the cells will indicate abnormal conditions, which, if allowed to continue, would cause trouble, says J. R. Lane, in The Telephone Review. Some of the indications are given in the following article.

The most frequent trouble is a partial short circuit in a cell. Probably the earliest indications of this are the absence or deficiency of gassing during overcharge, or falling off in voltage, or specific gravity as compared to surrounding cells.

Another indication of this trouble is: Positive plates lighter, and negative plates darker in color than those in surrounding cells. The cause is usually one of the following: Lugs touching at top of jar or supporting plate; a deposit of sulphate or sediment between lugs at same points; buckled plates; sediment touching plates; broken or missing separators. If the trouble is cleared at once, the cell affected may be used as a pilot cell for the next overcharge, which will usually bring it up to normal. If, however, the cell has become excessively discharged, an individual charge will be necessary.

There are many indications, aside from the regular readings, which tell whether or not the battery is being handled properly. The power may be so variable that the charging rate cannot be assured, especially in very small batteries. The attendant may be careless, instruments defective, variable load not allowed for, machine too small, and other complications may occur which indicate that the charging should be checked by other means than observing the readings.

One of the best indicators of the condition of the battery is the light-colored deposit on top of the positive plates. If this deposit is light and "powdery"; is easily brushed off with a toothpick, or pencil, and shows a rich brown color underneath, the battery is receiving sufficient charge. If it is hard and comes off in flakes or scales the battery is not overcharged long enough, or often enough. If the former condition is found, the buttons in the positive plate should be tested by sticking a pencil or toothpick or similar non-metallic point into them. If the point penetrates, or the bottom seems soft, the overcharge has been carried too far, or is too frequent, or the regular charge has been carried too far.

The gassing should be observed during charge. If the charging rate is correct, the bubbles will be about the size of a dime when the battery has reached the regular charge (five points specific gravity below the overcharge when tanks are fully equipped.) On the overcharge, of course, they will continue to grow larger until the level reading point is reached. If the charging rate is low, the cells will not gas freely. The gassing on the overcharge, by the way, has an important mechanical function, that of cleaning the positive buttons of the dead peroxide of lead. If the buttons have a "gummy" appearance, or are comparatively smooth, it indicates that the overcharge is not correct. The buttons should have a clean, brown appearance and the points should be sharp.

A mossy growth on top of the negative plates is caused by excessive overcharging. If the negatives appear rough and full of pits and holes on top, it is caused by allowing the electrolyte to get so low that the plates project above it. The instructions should be strictly followed in regard to adding water.

Buckled plates may be due to excessive overcharging, generally due to too high a rate, undercharging, or discharging at too high a rate. In the first case, it is due to the excess of peroxide, causing undue expension in the buttons. In the second case, it is caused by a deposit of sulphate on the buttons clogging them so they cannot expand. At the first sign of buckling, the cause should be determined by the indications given above and the condition remedied. Do not attempt to straighten the plates while in service.

Impurities in electrolyte are usually indicated by the positive plates becoming very light in color and the buttons or active material bulging out of the positive plates becoming soft.

Progress Report on Study of Inductive Interference

Committee of California Engineers Making Investigation of Interference Between Power and Communication Lines, Describe Equipment and Tests Made—Results not Definite—Investigation Most Thorough Ever Undertaken and of Greater Scope Than Originally Planned

The committee of engineers representing the electric wire interests in the state of California, authorized by the California State Railroad Commission in December, 1912, to investigate the subject of inductive interference between power and communication lines and to make recommendations for commission rulings intended to prevent undue interference, has issued a report of its progress up to September 1, 1913, which has just been made public.

Equipment Used in Experiments.

Since the first of the year a field force of from five to eight experimenters and computers has been engaged in collecting and computing data under instructions from the committee. The field force is equipped with a large amount of apparatus, including an oscillograph having three vibrtaors, noise standards, an impedance bridge, complete equipment for harmonic analyses and instruments of various kinds, the total aggregating in value approximately $9,000. Some of this equipment has been necessarily designed especially for this work.

Equipment is provided for harmonic analyses by either or both of two methods. The first involves the use of the oscillograph, the recorded waves of which are greatly improved for harmonic analysis by the use of a distortion circuit. This consists of a circuit containing inductance and capacity so chosen as to give distortion of the harmonics in approximate proportion to the square of the order of the harmonic.

The second method of harmonic analysis is by means of the use of what is termed the resonant shunt. This consists of a circuit containing inductance and capacity so chosen that, in combination with the capacity of the telephone line, the whole circuit can be made to resonate for any particular frequency or harmonic, the magnitude of which it is desired to measure. The currents so obtained are too small for direct measurement by any instruments available or suitable for this purpose. For this reason each current so obtained is passed through a telephone receiver, and the amount of noise given by it is equated with the noise in the same receiver produced by a current of the same frequency and of sinusoidal wave shape, produced by a wave generator consisting of a Vreeland oscillator. The latter current is computed from the constants of a circuit supplied by a measured potential difference.

The noise standard above mentioned is an instrument designed to measure the volume of noise that is produced by the current induced in the telephone line. This is accomplished by equating the noise set up by this complex wave in a telephone receiver with the noise set up by a pure sine wave of known amplitude having a frequency of 240 cycles. This comparison, of course, involves, in a large measure a personal element, but this is reduced in these tests by taking, as a rule, the average results of four observers trained to the work by experience.

Lines Under Observation.

The parallels on which this work has now been completed are four in number, all of which involve one telephone line. This is the main coast line trunk lead of the Pacific Telephone & Telegraph Co. (the Bell system on the Pacific Coast) between San Francisco and Los Angeles These parallels are all located in the counties of Santa Clara and Monterey, between San Jose and King City, a distance of approximately 120 miles. The telephone lead consists in the main of ten copper physical circuits, part of which are loaded and some of which are made up into phantoms. The high tension portions of these exposures are as follows:

First. A 57,000-volt, 3-phase line of the Sierra & San Francisco Power Co., approximately 20 miles long, between San Jose and Gilroy.

Second. A portion of the same line, approximately eight miles long, running into Salinas.

Third. A 22,000-volt, 3-phase line of the Coast Counties Gas & Electric Co., approximately 16 miles long, between Morganhill and Sargents, and overlapping the above-mentioned line of the Sierra & San Francisco Power Co. from Morganhill to Gilroy, for a distance of approximately 10 miles.

Fourth. A 33,000-volt, 3-phase line of the Coast Valleys Gas & Electric Co., approximately 40 miles long, between Salinas and King City.

All of these power lines are operated at 60 cycles.

Difficulties in Making Tests.

In all cases the telephone pole line is on one side of a public highway, and the power line or lines on the other side, with an average separation of approximately 60 feet. The power lines of the two separate companies overlapping as mentioned above, are erected one above the other. As these two power systems are operated from separate sources not in synchronism with each other, and as neither one can be shut down to enable the influence of the other to be independently measured, the difficulties of analyzing the inductive effects in this exposure have been enormously increased.

In order to eliminate the effects of induction from other power systems on through telephone circuits and from them to lines under test in the various exposures, it is necessary to cut all telephone circuits on the lead at the two ends of the exposure under test. Since the telephone lead is a main line of vital importance to the system of the telephone company, it has been necessary to make practically all tests between the hours of 10 p. m. and 6 a. m.

Since the line of the Sierra & San Francisco Power Co. between San Jose and Salinas is the only source of electric power for the greater part of Monterey county, it has been impractical to suspend service on this line for obviously desirable special tests, such as single phase short circuit runs with ground return, the application of single phase potential to ground on open circuit, etc., except on the rare occasions of general changes made by the power company, thus increasing the difficulties of the investigation.

The system of the Sierra & San Francisco Power Co. is operated with a solidly grounded neutral, and facilities were available for readily grounding the neutral of star connected transformers in the substation at Salinas, or removing the ground connection. This has enabled a thorough comparison to be made of the inductive effects of this system; first, with a neutral ground beyond one end of the exposure; second, with a neutral ground beyond each end of the exposure, the latter condition giving a return path through ground for unbalanced currents in the line conductors. The system of the Coast Counties Gas & Electric Co. is operated without a grounded neutral, making it possible to obtain a certain amount of comparative data between grounded and ungrounded systems, the comparison being limited by the facts that the two systems are of different voltage with different length

of exposure largely overlapping, different sizes of conductors, different spacing of power wires, etc.

Investigations Made Under Various Conditions.

Thorough investigations have been made of residual and balanced currents and voltages in the power systems, of the shielding effects of other wires on the telephone lead, of the existing transposition systems in both the power and telephone lines, and of the relative locations of the power and telephone transpositions; also of the effects of modifications of these transposition schemes.

Throughout parts of the above exposures of the telephone line, the same power lines parallel the Western Union telegraph wires and the signal circuits of the Southern Pacific company on the railroad right of way of the latter company. The effects of the power lines on these circuits have been included in the investigation.

The analyses of the inductive effects have been laborious on account of the large number of different forms of induction in action simultaneously. These may be listed as follows:

First segregation. Electrostatic and electromagnetic.

Second segregation. Effects of balanced and of residual currents or voltages.

Third segregation. Longitudinal and transverse induction.

The terms used by this committee under the above third segregation may be defined as follows:

Longitudinal induction is that which sets up an e. m. f. between a wire and ground, or a current through a wire with a ground return, or a current induction is that which sets up an e. m. f. between two wires, or a current in a circuit made up of two wires without a ground connection. It is obvious that in the case of a phantom circuit, the transverse induction is that between the two sides of the phantom, each consisting of two wires. It is also obvious that in general the transverse effect is the difference between the longitudinal effects on the two sides of the circuit. It is also obvious that the transverse induction is that of chief interest from the standpoint of interference with telephonic transmission.

Referring to the above segregation, attention may be called to the fact that each form of induction, transverse and longitudinal, is due in part to electrostatic and in part to electromagnetic influence, and that only one of these four effects, transverse electrostatic, transverse electromagnetic, longitudinal electrostatic and longitudinal electromagnetic, is due in part to the balanced currents or voltages and in part to residual currents or voltages. In order to make a complete study of the effect of transpositions, each of the eight effects must be considered independently. The transposition problem is further involved by the necessary transposition system of the telephone wires between themselves to avoid cross talk, which in itself is elaborate on a heavy lead.

In the case of the exposures so far investigated, it has been impossible to get enough transverse induction under normal operating conditions to obtain oscillograph records of sufficient amplitude for harmonic analysis. The study of the transverse induction has therefore been limited to the results obtained from the noise standard and the use of the resonant shunt apparatus. A difficulty introduced by this condition is that the use of the resonant shunt apparatus involves successive measurements of the several harmonics. Between the times of these measurements the load on the power system may and does vary, and what is more essential, the shape of the waves of the power system, and particularly of the residuals and of the neutral current of same, varies.

On the whole, the investigation, so far as the currents and voltages of the power system are concerned, has resolved itself into a determination of the relatively small difference between almost exactly equal quantities, that is, into a determination of the residual voltages and currents which are minute, compared with the main voltages and currents. This has involved an elaborate study of the errors introduced by the use of the necessary current and potential transformers, and particularly of the effects of same on the higher harmonics. As might be expected, the work of computation and the analyses of the data obtained greatly exceeds the work of actually making the tests.

The joint committee has a membership of 15 engineers, part of whom represent the power interests, part of communication interests in the state of California, and part the State Railroad Commission. The necessary funds for the work have been voluntarily contributed by the power and communication interests of the state. A large amount of the apparatus used has been loaned by the Pacific Telephone & Telegraph Co., some has been purchased by the committee, and a relatively small amount, consisting of current and potential transformers, oil switches, etc., has been loaned by the power companies.

Investigation of Greater Scope Than Anticipated.

So far as can be determined by the members of the committee, no investigation of these complicated phenomena has ever been undertaken heretofore on a scale comparable with that of this work, either in magnitude or in the matter of thoroughness. The study has developed into an investigation of much greater scope and complications than was originally anticipated. Although eight months have already been spent on this work, which has not been allowed to drag but has been pushed continuously and as rapidly as possible without detriment to the work, the investigation has not as yet been made on a sufficiently large number of exposures of different characteristics to allow of any general conclusions.

No statement can as yet be made regarding the recommendations of this committee on this set of exposures, since these recommendations have not as yet been presented to the State Railroad Commission. While the complications of the problem now appear, to those carrying on the work, so great as to make extremely difficult the drafting of general remedial measures which shall not be onerous on the interests involved and shall not be subject to so many exceptions and alternatives as to make them ineffective, the committee expects that with sufficient time and financial assistance this work can be made to serve as a basis of rulings which will be not only helpful to the communication interests, but also to the power interests in the way of standardization of construction and operating methods and the reduction of interruptions to service. Members of the committee also feel that, more important than the above, the work will enable the Railroad Commission to make rulings which will in future reduce harmful agitation, legislation and litigation.

New Exchange Building in Baltimore.

The Chesapeake & Potomac Telephone Co. has completed its new Homewood exchange building in Baltimore, Md., and the cut-over will be made without two minutes interruption this week. The building is fireproof and is three stories high, the third floor being devoted to a rest room, locker room and dining room for the operators, and there is also a roof garden for their exclusive use.

Sale of Bell Company Notes.

J. P. Morgan & Co. and Kidder, Peabody & Co. have purchased an issue of $10,000,000 six months' notes, which are the obligations of four subsidiaries of the American Telephone & Telegraph Co., namely, the Nebraska, Iowa, Southwestern and Northwestern companies. The notes are endorsed by the parent company. They were sold in an hour on a 5½ per cent. discount basis, and half of the issue was allotted to New England.

Some Telephone Traffic Problems and Their Solutions

Developing Efficiency in Operating and Eliminating Unnecessary Work—Pointers in Local Operating for Reducing Operators' Duties—Toll Operating Methods—Paper Presented at Annual Convention of North Dakota Independent Telephone Association

By Paul Bunce

The duty of a traffic man, a manager or a district manager who has charge of the operating, is to give the best telephone service possible at the cheapest possible cost. It is realized that this is a dangerous phrase to use, as it might suggest cutting down expenses to the detriment of service. At the outset, it should be stated that the way to cut down expenses, or to keep expenses at a minimum, is not by underpaying operators or reducing their salaries. This generally results in lost efficiency, impaired service and, in the larger exchanges, more operators to handle the same amount of work.

Methods of keeping expenses down can be considered under two headings, viz.: Develop the greatest possible efficiency in the operating force; and eliminate unnecessary work.

Only the second heading, that of eliminating unnecessary work will be discussed at length. It is there that the largest results can be obtained, as efficiency is largely dependent on local conditions. A few things that tend to increase efficiency will however be mentioned.

Developing Efficiency in Operating Force.

Efficiency depends more than anything else on the health of the operator and degree of contentment with her position. The number of hours worked per day, except in the smaller exchanges where an operator has considerable dead time on her hands, should never exceed nine and should approach eight hours per day as the ultimate.

Regular relief periods should be allowed twice a day so that the operator can get away from the switchboard at least ten minutes in a separate room from the operating room. Magazines should be provided, and the operators encouraged to help make the room cozy and attractive. In addition to the relief periods, what is called the standing relief is very acceptable to the operators. At a given signal, allow the operators to stand up and operate for a short period. This was recently tried at one of our larger exchanges for a five-minute period and was changed to ten minutes, which seems to be about right. Every operator who has been working for a year or more should be given a ten days' or two weeks' vacation on full pay once a year.

The topic, eliminating unnecessary work, naturally divides itself into two subdivisions, local and toll operating. Local operating will be first considered.

There is no more reason for giving out train reports than there is for giving out information for the agent regarding express shipments, or for the grocer regarding the price of eggs. In several cases where the practice has been eliminated, the chief operator at first objected, as she claimed the station agent gave such slow service that she could save time by giving out reports herself. If your agent is slow, I would say that it is probably your own fault. Did you ever try reporting one of these slow agents to his superintendent? If you haven't, you will probably be surprised at the quick results that can be obtained. In all cases that have been brought to the writer's attention, the superintendent has ruled that he expects the agent to give just as prompt service over the telephone as at the ticket window and the agent has been so instructed.

Besides adding unnecessary work, the giving of train reports allows a chance for criticising the telephone company in case of error. One instance is recalled where a patron was told by the telephone company that the train was half an hour late. It came in 15 minutes late, and the man missed his train. He is still sore at the telephone company.

In general calling by name should not be allowed in exchanges of over 100 subscribers. In this matter as well as in giving out train time and other irregularities, the attitude of the public may be misunderstood. One is apt to imagine that a subscriber feels that a favor has been granted him, whereas his real feeling may be that he has worked you. Your own respect for a man decreases if you find that he is easily worked, while your respect for him increases, if you try to work him and can't. Calling by name adds very materially to the work of an office, especially if there are any new operators on the force.

The way to eliminate calling by name in an exchange of more than one or two operators, is to refer the call to the chief operator. The subscriber soon learns that he can get quicker service for himself by looking up the number than by waiting for the call to be referred to the chief operator. If the exchange is a one or two operator exchange, the operator can say, when a subscriber calls for Mr. Arthur, "His number is 123, I will ring them." This suggests in a courteous way that he use his directory, and its repetition attracts his attention.

In the large exchanges, the phrasing should be watched. For example, an operator can say "Number" about one-fifth of a second quicker than she can say "Number Please." This may seem like a small saving, yet in Fargo, where there are on an average of 30,000 calls per day, this would amount to one hour and 40 minutes per day. Similarly "I'm ringing your party" can be shortened to "I'm ringing them" and "The line is busy," to "Line Busy."

Unnecessary Ringing.

A subscriber should be rung three times at 30 second intervals. The ringing of a subscriber is comparable to the ringing of a door bell. One does not go up to a man's house and ring his door bell six or seven times at short intervals, neither does one stand there and ring more than two or three times in case a response is not obtained. Yet, occasionally, operators and quite often the public expect such ringing over the telephone. This fault develops very easily in magneto exchanges and is generally caused by the operator herself coming in on local connections with the word "waiting" instead of "I'm ringing them."

The word "waiting" suggests to the subscriber the idea that the operator does not know what has taken place on that connection. It carries with it something of the idea which, if put in words by the operator, would be "Aren't you through on here yet?" The word "waiting" with the rising inflection thus develops the notion in the subscriber's head that when he does not get his party, the operator is to blame for not ringing him and she is obliged to ring five or six times to satisfy the calling party.

The average subscriber, especially women, will wait on the line until told by the operator that the party does not answer. It is therefore necessary to get the confidence of subscribers that the connections are being properly watched in order to have them leave the line satisfied when told that their party does not answer. In connection with unnecessary ringing, it has been interesting to the writer to note the relation between this and a supposed shortage of cords. Occasionally a

chief operator will say that there are times in the day when she hasn't enough cords to handle the rush of local calls. In every case the operator has been found using the word "waiting," instead of "I'm ringing them," thus tying up her connections.

Do not allow operators to do part of the chief operator's work. In the larger exchanges the local operators should be taught that they have only a few phrases they can use. If they cannot answer with "What number," "I'm ringing them" and the two or three other phrases which are assigned to them the call should be referred to the chief operator. For example, a subscriber, possibly a foreigner talking broken English, asks for a number. The operator does not understand and asks "What number?" If she does not understand him the second time, she has no phrase to use, and should refer the call to the chief operator. If she does not refer the call at this point, she is liable to spend several seconds in trying to get the number, while several other calls are delayed as a consequence. A local operator should keep her position clear all the time and not get tied up with one subscriber.

This brings up a discussion of eliminating unnecessary work in toll operating which will apply to only those exchanges that are doing their own checking. If an exchange is centerchecked at some other point, the toll operating is probably reduced to a minimum.

Single Ticket Operating.

Single ticket operating is in general operated without making "in tickets" except as occasional memorandums, in case of "busy," "don't answer "and on a few other reports. One operator at Fargo is now answering all of the incoming calls on 30 lines handled on this basis. On a two-ticket basis one operator can handle only about six to eight busy lines. There are other incidental advantages too numerous to discuss. It might be mentioned that delays are sometimes caused by one operator waiting for another operator to put up her party before she puts up hers. This is eliminated in single ticket operating.

The more operators a call passes through, the more chances there are for errors. It is much more satisfactory for an "Out" operator to talk directly with the subscriber at the other end of the line, than to get her information second hand. Single ticket operating, more than anything else, has enabled us to make considerable reduction in toll operating cost at Fargo. A few figures which are averages for the two months, August and September, for the years 1910, 1911, 1912, are given in the following table. The figures are in round numbers.

Year.	Good Out Tickets.	Operating Cost.	Cost per Good Out Ticket.
1910	14,000	$700	.048
1911	17,000	665	.039
1912	22,000	600	.028

The operating cost includes salaries of toll operators and supervisors. The number of tickets increased 57 per cent., while the cost per good "out" ticket decreased 58 per cent.

Probably all who have been in an operating room during the past two or three years have writhed in your chairs, watching the operator trying to build up a connection through three or four switches. The method of procedure would be about as follows:

The operator would get to about the second switch and get an *N C* (no circuit) report. After 10 or 15 minutes' delay, the operator possibly gets through to the terminating station and tries to pass the operator there the call. The transmission is poor and she has hard work to make her hear. After talking loudly for a few seconds, she drops the connection to answer some local calls which have accumulated. She then comes back to her circuit and finds that some intermediate station has disconnected, so she proceeds to again build up her circuit.

Calls have been delayed for eight or ten hours because of *N C* and delays in repeatedly building up long circuits. This disconnecting can be remedied by instructing the operators that a through connection is not to be taken down until they are told to do so. The originating operator should clear the circuit when she is through, by ringing the next station and so on to the end of the circuit. Delays on account of *N C* are materially reduced by having an operator, when she reports *N C* to a station, make a memorandum ticket as a reminder that this station is waiting for a circuit. The operator has to dispose of this ticket and thus becomes responsible for the connection until it is completed.

There has been nothing established in connection with toll operating which has been a source of as much satisfaction to the toll operators as being able to build up a long connection through any number of switches and knowing that the circuit is theirs until they release it. The amount of time saved can often be measured in hours.

Relay or Through Tickets.

In general, relay or through tickets should not be made out unless it is absolutely necessary. Records show that at Fargo during August, 1907, there were 5,330 relay tickets made out, while during August, 1912, although the total volume of business had probably very nearly doubled, the number of relay tickets had been reduced from 5,330 to 474. A relay ticket is generally made for the same reason that a call order ticket is made, i. e., to assist the "out" operator in getting her call completed. On account of the highly developed spirit of cooperation between the different companies in North Dakota, an effort to cut out relay tickets is now being made at the exchanges which are connecting points between two companies. If the auditors and the managers would study this and work together, over half of the relay tickets now being made on connecting company business in North Dakota could be eliminated.

No toll privilege affects both local and toll operators in every exchange, no matter how small. Unless a manager has reasoned the thing out for himself, he soon finds that he is granting special privileges to certain subscribers and the operators are carrying the load. A safe rule and the only rule to adopt regarding special privileges, is not to allow any one subscriber a favor that the company is not willing to allow all. If a subscriber wished no long distance calls at all charged to his telephone, that is easily handled. Mr. Jones, however, says that he wants no long distance calls charged to his telephone unless O. K.'d by himself or his wife. This should not be allowed. Any system of operating, which forces the operator to recognize the voice of the party calling, is a faulty system. Whenever a new operator is employed, she is badly handicapped.

Use of Codes.

It is possibly unnecessary to say much about the use of code cards, as the codes are pretty well established. In fact, *W H* is so well known that sometimes the public uses it, yet it is desirable to keep hammering away at the idea and insist on the operators sticking to the code card. It should also be seen to that the full benefit is derived from the codes. For example, operators are often heard to say, "We will *W T* to Mr. A," which could have been shortened to "*W T* Mr. A." as *W T* means "we will talk to." There is just one suggestion regarding codes which will be mentioned. It is the use of standard abbreviations for towns such as *BK* for Bismarck, *MT* for Minot, *F* for Fargo, etc. This is done by some companies with entire success and saves time in making out toll tickets.

In studying your own exchange with an idea of eliminating unnecessary work, don't forget to ask the advice of the chief operator. The average chief operator usually knows more than the manager about these matters and, if encouraged to point out faults, will see them quicker than anyone else.

A New Force in Business—The Power of the Trade Press

The Class Journal Reaches the Minds and Hearts of the Captains of Trade—Opportunities of the Press for Greater Work—Abstract of Paper Presented at Annual Convention of the Federation of Trade Press Associations

By R. R. Shuman

It is with a feeling of respect almost akin to awe that I presume to stand up before this audience of the leading publishers of trade and technical media of the United States; for I realize, as perhaps but few of you individually realize the power which lies in your hands. And it this power, this new force in business about which I shall speak.

As periodical visitors to the desks, to the minds and the hearts of the captains of trade and industry of this nation, you yield a power far greater than that of the political press, greater than that of the pulpit, greater than any other publicity force that now exists in this or any other country, for the pupils who sit at your feet are not the idle, the thoughtless multitude, but are that great masterful 5 per cent. of the population of this country who control the labor or market the products of the other 95 per cent. Your pupils are the men who have built and are building America's industrial and commercial greatness, and your instruction given with so lavish a hand, has, I firmly believe, done more to put America in the forefront of the commercial and industrial nations of the earth than any other one influence.

What Technical Journals Have Done.

To give an index of the power of the technical journals, it is only necessary to study into the equipment and methods prevailing in manufacturing plants of today compared with those of only a very few years ago.

Science and up to date efficiency engineering have taken the place of the rule of thumb in manufacture. The printed word has vastly simplified and facilitated the solution of problems of securing first hand distribution of the products made.

Power of the Class Journal.

The class journals, those concerned with both manufacturing and merchandising—the journals zealously devoted to specialized fields of endeavor—have become powers in those fields in direct proportion to the intelligence and unselfishness with which they build for others while they build for themselves.

In both the avenues of trade and of industry, the periodicals which you publish give to every subscriber the benefit of the latest thought, the latest development of machine or method which the most powerful organizations of the country have been able to devise.

The time was when a few manufacturers or merchants could control at least a partial monopoly of the shortcuts and efficiency plans which they had developed or adopted; but that time has gone and the brains of each, the creations of each, the efficiency-developments of each, become, through you, the property of all.

Your editorial pages give freely information which cost you, or which cost others, vast sums of money.

Your advertising pages thrill with messages of betterment in appliance or in merchandise. And more and more the subscribers to trade and technical and class journals are coming to read the advertising pages of those journals with a care which is a true index of their valuation of the importance to them of those advertised messages.

The time has gone by when you are the hangers on in any trade or industry. The time has gone by when you are respectable beggars for crumbs at the rich man's table.

You sail the seas of your industries or trades, not as something towed behind, but as the very engines that impel the industries themselves.

Space Rates Too Low.

I want to see you charge more for your advertising space, if you believe it to be worth more.

Your rate is your own estimate of your worth—a measure of your faith in yourself—your own dollar-and-cent estimate of your own right to live.

I know a publisher who charges $92 a page per month on a yearly contract, in a paper that has only 4,000 circulation—and he is mighty particular whom he admits into his pages even at that price—and I know of publications claiming 20,000 circulation, which have not the nerve to ask half that price.

The $92 man holds his head so high above the rabble, that he can't even hear the whine of the penny-souled who would buy space as they buy mop rags. His faith in his mission to his subscribers has given him a moral sinew with which he has dug bright gold out of stony ground.

This advice to advance your rates sounds like insanity coming from a man who is one of the largest space buyers in your class of journals in the country; yet let me tell you here and now, that almost without exception, it is the high-rate journals that show the largest returns per dollar of cost. And, per contra, it is the low-rate and the "special bargain, cut-rate-to-you-to-get-started" fellow who discredits trade and technical journals in the eyes of men who are accustomed to paying good prices for good goods in the expectation of getting full money-value for what they pay.

No journal will ever measure up to its rightful place in this great new force in business, which does not mark its goods in plain figures, and stick to those prices to the last penny.

Honesty in Advertising.

Another privilege which is also a duty, and which I know will be a pleasant duty to you, is active co-operation with the National Vigilance Committee of the Associated Advertising Clubs of America in their self-imposed task of enforcing honesty in advertising. Laws have already been passed in a number of states, usually in the face of strong organized opposition, which make a penal offense for an advertiser to lie or mislead in his advertising copy.

Too many, yes most, of our daily newspapers and popular weekly and monthly magazines are now carrying more or less advertising that is absolutely fraudulent and sometimes loathsomely indecent. Most of this business comes from advertising agencies giving the publisher an excuse to dodge his own moral responsibility for sending printed pickpockets, confidence men, and lewd characters into the home of his trusting subscribers.

Fortunately your columns are free from this kind of sinning; and being free you are permitted to demolish the glass houses of the guilty.

Here again, your concerted attack, directed at the eyes and consciences of the men who are back of all business will carry tremendous weight. So much so that I believe it lies in the power of the publications here represented to fan a flame of public opinion among men of real influence that will in one year lead to the passage of a national law, as well as state laws, which will forever protect the public against a form of

privileged piracy that has so grievously hurt confidence in all advertising.

By throwing your souls into the crusade for honesty and cleanness in advertising, you will render a service to the whole people, which is past computation and will at the same time exalt and advance the business of advertising by making all advertising believable. Then and only then, will advertising come into its true birthright—and every honest man in every honest relation to advertising will receive his just reward.

The Circulation Liar.

The new force in business which lies in your hands is crippled by another handicap, which, like the ones just named, is inexcusable because unnecessary. I refer to the too general disbelief in circulation figures—a disbelief that can have no other source than the fact that public confidence has been violated by the circulation liar.

Though I believe that trade and technical journals have, as a class, sinned less in this particular than have the daily, weekly and monthly popular publications, yet I believe I am right in saying that you, as a class, lose more business from this suspicion than does any other class of publications.

You have *two* easy remedies in your hands:

First, so insistent an agitation through your own columns that the postoffice department at Washington will be forced by public clamor to issue an order declaring all records of second class entry public property. When that rule is promulgated and not until then, the United States government will cease to be accessory to a fraud by shielding palpable fraudulence.

Second, a more and immediate and infinitely easier solution lies in your own hands, as an association: namely, to make membership in your body available only on condition that an auditor employed by your body have access at all times to the circulation books, and that his findings be published in such a way that every prospective advertiser have access to the figures.

Such a course on your part would automatically divide all journals into two classes: those whose circulations were attested by your responsible body; and those not thus vouched for.

Power and Opportunity.

There is not a trade abuse that you cannot kill utterly if you but use your power. There is not a dishonest man or firm in any business within your special range, that you cannot put out of business or force into honesty. There is not a bad law on the statute books of state or nation that you cannot abolish.

The time it will take to do these things will be long if you trim and temporize and weigh each act in the balance of your own immediate advertising income; while results will be grandly quick if you grandly rise above such consideration and, as a body all working together, make a fearless armed charge to the heart of the breastworks of every such evil.

Every lawbreaker is a coward, every wrong-doer a bat fearing the light. You control the searchlights. Turn them into every dark place. The honor and the credit, and the esteem and the confidence that you will win individually and as an association, by such a stand, will augment, multiply and forever establish the New Force in Business which each of you has already done so much to create.

Financial Report of Bell System.

The American Telephone & Telegraph Co. and associated companies report gross earnings for the eight months ending August 31, 1913, amounting to $141,963,035, as compared with $120,615,075 for the corresponding period in 1912, an increase of $12,347,960. Total expenses amounted to $102,854,840, as compared with $92,235,237, an increase of $10,619,603. Net earnings were $39,108,195, as compared with $37,379,838, an increase of $1,728,357 over the first eight months of 1912. The interest paid amounted to $10,994,010, as compared with $9,073,075, an increase of $1,920,935. The net profit balance was therefore $28,114,185, as compared with $28,306,763, a decrease of $192,578. The dividends for six months and estimated dividends for two months amounted to $20,189,628, as compared with $19,429,417, an increase of $766,211. The surplus earnings were therefore $7,924,557, as compared with $8,877,346, a decrease of $952,789.

The increase in expenses was made up as follows: Operation, $49,677,539, as against $42,384,436 for the first eight months of 1912; current maintenance, $21,142,752, as against $20,871,580; depreciation, $24,809,543, as against $22,251,630; and taxes, $7,225,006 as against $6,727,591.

A comparative report of the American Telephone & Telegraph Co. alone, for the nine months ended September 30, 1913, shows total income of $34,191,981, as compared with $31,273,861 for the corresponding nine months of 1912, an increase of $2,926,121. Net earnings were $30,349,622, as compared with $27,773,194, an increase of $2,576,427. After deducting interest of $5,706,358 as against $4,176,605 for the previous period, the balance is shown to be $24,643,264, as compared with $23,596,589, an increase of $1,046,675. The dividends paid were $20,561,972, as compared with $19,320,831, an increase of $1,241,141. This leaves a balance of $4,081,292 as compared with $4,275,759, a decrease of $194,460.

The total earnings of the foregoing statement are made up as follows: Dividends, $19,352,982, as compared with $17,670,134; interest and other revenue from associated companies $10,040,940, as compared with $9,278,780 for the previous period; telegraph traffic, net (one month estimated), $4,276,617, as compared with $4,013,917; and other sources, $529,443, as compared with $311,030.

The expenses of the company amounted to $3,850,340, and for the nine months of 1912 they were $3,500,667.

The recent slump in the stock of the American Telephone & Telegraph Co., due to the rumors pointing to government ownership of telephone and telegraph lines, is discussed as follows by a director of the company:

"No stockholder is going to part with any of his property without being duly compensated. Suppose, for example, the government should take over the long distance lines. That means but $14 per share for stock on the basis of its present book value, or less than the decline of 18 points in the shares from the year's high mark; in other words, even if the government took the long distance lines without paying a cent, the present shrinkage has discounted everything."

President Theodore N. Vail of the American Telephone & Telegraph Co. said regarding the situation:

"I know that the department of justice is endeavoring to reach a solution in respect to telephone matters which will be just to the public and at the same time not sacrifice private interests."

Effort to Prevent Chicago Merger.

Harold D. Stroud, secretary of The Telephone Users' Association, of Chicago, has begun a campaign to enlist the Association of Commerce in his fight to prevent the sale of the automatic telephone system to the Bell company. He sent to members of the commerce association letters inclosing forms for an appeal to W. R. Humphrey, the association's industrial commissioner, urging a recommendation that the city purchase the automatic plant and equip and operate it. He also urged the addressees to write their aldermen along the same line and to induce voters to do so.

Blind Troubleman Buys Exchange.

T. M. Worrell, who, although totally blind, has been the troubleman for the Haileyville telephone system, of Haileyville, Okla., has purchased the exchange and will hereafter have full management of it. As troubleman Mr. Worrell depended on his hands to feel his way along the wires and has done work as a lineman as efficiently as though he had two eyes.

In the Rural Line Districts

The shareholders in Lyle & Clyde Bum Telephone Co. (a corporation) ought to feel proud of the way their line is kept up at such little cost, and their officers ought to be praised for the way they handle the business of the company. Prompt collections (and slow pay) is the motto that is well followed. We hope the officers will be re-elected for the coming year.—Lyle Correspondent, Medford (Okla.) Star.

W. C. LaRue, Supt. of the Osceola Farmers' Mutual Telephone Company is the happiest man in Osceola at the present time. (?) He has begun operations for the printing of a new telephone directory which will be completed in a couple of weeks.—Osceola (Wis.) Sun.

Two extra operators have been added to the force at the local telephone exchange. Manager Meverden is endeavoring to overcome the difficulties which have confronted him during the past four weeks, and he is succeeding in getting the service in good working order again.—Iron River (Mich.) Report.

The Mutual Telephone Co. had an expert workman here from Mt. Pleasant last week, by the name of Schultz. He fixed our phone up in fine style. He put in new coils and repaired the grounded wires and fixed the buzzer and did many things that are the work of an expert. He climbed the telephone pole back of the shop and he ran up like a circus performer. His safety belt got hooked over a nail or something and it looked for a while as if there would be a tragedy but he overcame it all right and got down without breaking any legs or anything. He is the finest electrician we have had around for a long time. There are only a few like him.—Washington (Ia.) Democrat.

The switchboard for the Evans' Telephone Company arrived Saturday and is now being installed. It is a neat little board with a capacity of 150 light drops and 40 magneto lines.—Paterson (Calif.) Irrigator.

There is a telephone line started from Conata north toward 2 south. Guess Quinn will have to start one south and sometime we may talk from one railroad to the other.—Quinn (S. Dak.) Courant.

The literary society will discuss the subject of a telephone line from Graylin to Sterling next Thursday night. The captains for the contest will also be selected. The question for debate will be: "Resolved that, Socialism would be a detriment to the welfare of the world."—Graylin Item Sterling (Colo.) Advocate.

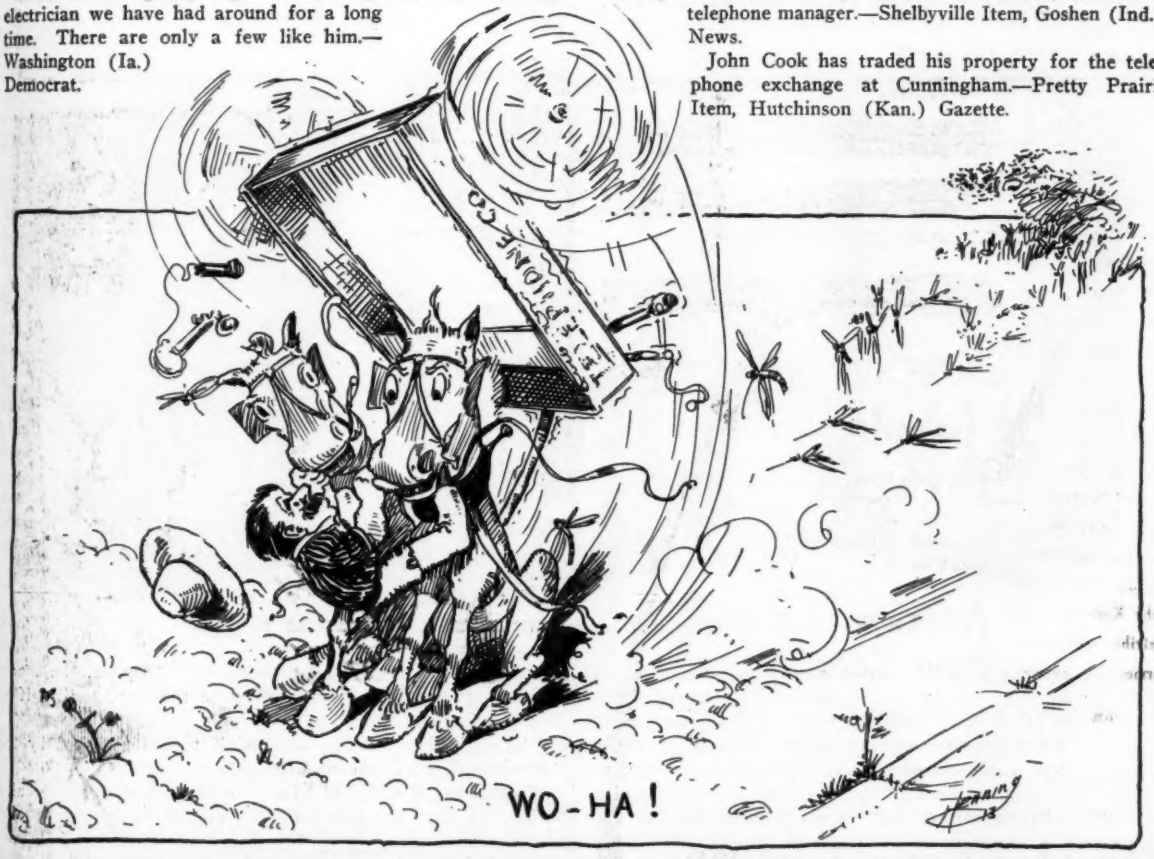
The Lapee Phone Co. have bought Dr. Kay's office building and will move into it soon.—Lapeer (Mich.) Press.

The 106 telephone line through Medford, which has been a torment to everyone because of the large number of subscribers, 17, on the one line, will next week be divided which will be a great relief to all.—Medford News, Faribault (Minn.) Journal.

The new phone line north of town is completed and in operation. These phones are the very latest, being supplied with a magneto. When the young folks want to talk the phone is automatically switched onto the magneto, thus saving the batteries from an early death.—Maples Correspondence, Clark (S. D.) Review.

"Only five minutes to spooners," is the order of the local telephone manager.—Shelbyville Item, Goshen (Ind.) News.

John Cook has traded his property for the telephone exchange at Cunningham.—Pretty Prairie Item, Hutchinson (Kan.) Gazette.



The Standard Telephone Co.'s team figured in a sensational runaway Monday afternoon when they were frightened by a swarm of mosquitoes lighting on them. The team ran down North Third street to Main, and up Second street. They ran into a farmer's buggy and broke the hub. F. E. Clute finally captured them.—Lansing Item in Dubuque (Ia.) Herald.

From Factory and Salesroom

Convention: Quarterly Meeting Western Pennsylvania Association, Uniontown, October 23, 34

Automatic Electric Co. Bulletin On Cable Maintenance.

Summing up and putting into accessible form the results of wide and varied experience, "Maintenance of Lead Covered Telephone Cables," an engineering bulletin, has just been issued by Automatic Electric Co. of Chicago, and should be of great interest to all engaged in telephone cable maintenance, whether for automatic or manual plants. The pamphlet was compiled by Bernard C. Groh, of the company's technical staff, and contains a resume of standard methods of dealing with "trouble" together with illustrative diagrams and tables of reference. The subject is an important one and an authoritative treatment of it cannot fail to prove of value. This bulletin is being distributed free and is another example of Automatic Electric Co.'s established policy of extending every aid possible toward an increase in the efficiency of telephone operation.

Equipment for Kansas City Railroad Terminal.

By John H. Finley.

Perhaps one of the greatest and most expensive railroad terminals in the United States and in fact in the world, is the new Union Terminal in Kansas City, Mo. The total cost including approaches will be in the neighborhood of $40,000,000. Railroads to the number of 14, will have their terminals in this immense structure.

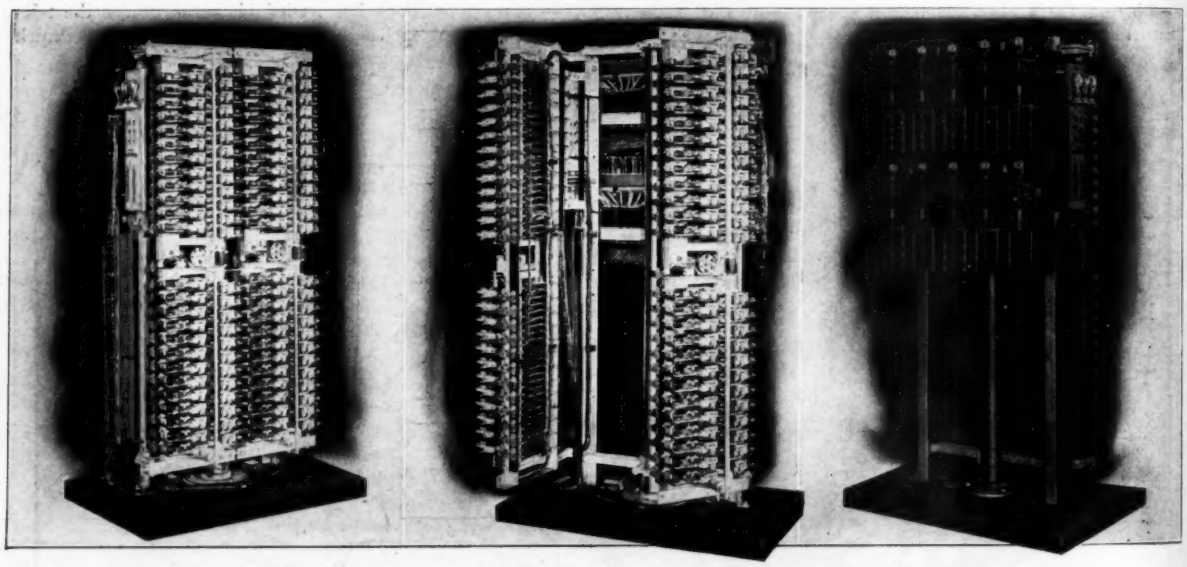
In designing the most rapid and efficient as well as most economical telephone service for this mammoth project every phase of the subject had to be considered. The simplest method for the officials to follow, so far as regards effort on their part, would have been to turn the whole telephone business over to the Bell company, sign a contract, and blindly pay the price assessed yearly. The men in charge of the operating department, however, were far-sighted enough to look ahead and provide for their company a service which they will control absolutely and on which it is said they can always rely; a service owned and operated by the terminal company, which is full automatic. With this service it is contended that it is possible to save a week's time per year for every man using one of the telephones and in maintenance and operation $4,000 per year over the Bell cost of equivalent service.

The scheme of telephone service adopted consists at present of one of 100-line automatic board for local and terminal business with a capacity for an additional 100 lines; a 50-line automatic board for tower and siding service around the terminal and towers, with a capacity for an additional 50 lines for this class of service; a 40-line Bell board for city service in Kansas City and for such long distance calls as the officials may require, with an additional capacity for 60 lines.

The illustration shows the type of automatic board which will be installed. Another illustration shows an automatic telephone with the dial. By the simple operation of this dial, the subscriber is able to call anyone whose telephone terminates on his exchange, or his system, in less than 4 seconds or to find out why. Every operation is automatic, the system has an automatic ringing device, automatic busy signal, and automatic connection. The only manual operation is selecting the number by means of the dial.

It is said to be the most natural thing in the world for railroads to adopt automatic telephones. They now have automatic pumps, automatic air brakes, automatic signals, automatic couplers, and a thousand and one other automatic devices which expedite travel, work and traffic in general, and save lives, property and expense.

There is no place in the world where the old adage, "Time is money" is as applicable as on a railroad, and especially around a railroad terminal. Hence the growing demand for automatic devices, and time saving contrivances, and, if coupled with these two a saving in money can be made, almost any one in business will seize the opportunity, if it is properly presented.



Type of Automatic Board to Be Installed in the Kansas City Railroad Terminal.

The equipment for this terminal is to be furnished by the Automatic Electric Co. of Chicago.

The telegraph office of this terminal is one which is also up-to-date in every sense of the word.

The test board is very complete, and consists of a telephone jack board and telephone cords and plugs.

The calling system is also unique, inasmuch as the calls for Kansas City Terminal will come in over a selector.

The operation of this selector will light a lamp in front of an operator, similar to the manner in which a telephone lamp is lighted at the central office by the subscriber starting a call. These lamps remain lighted until the call is plugged out by the operator, but the line is not tied up during this interval if any delay occurs in answering.

There will be 50 telegraph lines in this office for the present,

The Automatic Desk Stand.

each equipped with a selector as outlined, arranged to connect through the test board for testing for crosses, grounds, opens, excess resistance and other faults liable to occur on telegraph lines. There will also be provisions for patching, grounding, battery changes, compositing and other features entering into the maintenance of such circuits.

The connecting rack or main frame is so wired that the circuits can easily be cross connected to any desired table, selector, or jack on the test board.

This test board is equipped with a voltmeter, ammeter, and Wheatstone bridge to assist in locating and correcting trouble.

The tables are each equipped with pilot lamps, in addition to the regular quota of 30 lamps and jacks. These pilot lamps light when any circuit calls are put in for any of the 30 circuits appearing on this table. There is also a buzzer associated with the pilot relay which notifies the operator or wire chief, in case the operator happens to be away from the table at the time the call comes in. This buzzer is on a distinct circuit, and is normally cut off from the line, being switched in the circuit only when all the operators leave a table.

The telephone train dispatching lines are also terminated on the table in such a manner that calls may be handled the same as telegraph calls, and these lines also are carried through the test board to facilitate maintenance and insure efficient and economical operation. All necessary tests, patches, cut-offs and cut-overs can be made at the test board. A separate cabinet is provided for the telephone selectors and relays.

The same storage battery provides current for the telegraph selectors, telephone selector relays, telegraph sounders, and for all other purposes in the telephone and telegraph room.

The arrangement of the office for carrying on business is ideal in every particular, and Mr. Rider, superintendent of the terminal and Mr. Marsh, superintendent of telegraph are to be congratulated on their efficient and economical arrangement of equipment and offices.

Johns-Manville Exhibit at New York Electrical Show.

One of the interesting exhibits at the New York Electrical Exposition and Motor Show, opened at New York City on October 15, was that of H. W. Johns-Manville Co. Included in this exhibit were a number of specimens of J-M Transite Ebony Asbestos Wood, a material which is fast supplanting marble and fibre for making switchboards in central stations and power plants. It is also being widely used for vault terminal boards, lining switchboxes and all other purposes where high mechanical and dielectric strength are required. The material is said to be absolutely free from metallic veins and remarkably tough. Yet it is worked as easily as ordinary wood and takes a very high polish.

J-M Fyro Fire Extinguisher, which is said to be one of the most effective devices of its kind on the market, is also shown. The J-M Fyro is of the one-quart type and discharges a liquid which, it is claimed, has 40 times the effectiveness of the usual soda and acid solutions. It operates successfully on compressed air and is so simple that a child can operate it. A single wheel about the size of a silver dollar is turned and the J-M Fyro does the rest. It puts out electrical, gasoline, naphtha and all other dangerous fires if used during the incipient stage.

Among the electrical products exhibited are a number of Noark protective devices, including Noark fuses and blocks, Noark service boxes and J-M fibre conduit. The Frink and J-M Linolite illuminating systems exhibited consist of modern fixtures for bank, store, office, residence, hospital, show case and show window lighting. Parian glassware used in connection with J-M "Direct-Indirect" lighting systems gives, what may be called, "sunlight without glare." The Frink and J-M Linolite systems of lighting show up details with remarkable clearness and eliminate shadows. In show-window and show-case lighting the source of light is hidden from the eye. These systems cost less for current consumption than the old-fashioned systems. This, together with their superiority, accounts for the fact that they are already installed in over 30,000 stores.

The H. W. Johns-Manville Co. has a complete line of attractive and interesting literature on each subject exhibited, which they state they will be glad to forward to anyone interested.

Telephone Improvement Co. Gets Lima, Ohio, Orders.

The Telephone Improvement Co., Chicago, has been awarded the contract for a two-section rural switchboard by the Lima (Ohio) Telephone & Telegraph Co., which also adopted the automanual standard toll specifications after tests of the equipment had been made in comparison with Bell equipment between Lima, Ohio, and New York City, over long-distance lines. The determination of this toll question at Lima places great credit upon H. G. Webster, chief engineer of the Telephone Improvement Co., who conducted the tests for the Telephone Improvement Co. at Lima.

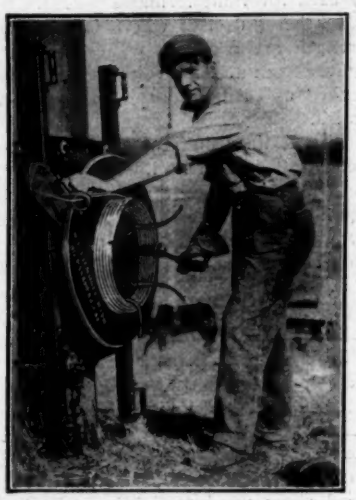
U-S-L President Goes Abroad.

Pressure of business requiring his immediate attention in England and on the Continent caused J. Allen Smith, president of the U. S. Light & Heating Co., manufacturer of the U-S-L electric starter and lighter, storage batteries, and electric car lighting equipments to start on his second trans-Atlantic trip of the year on the 11th of this month. Mr. Smith will not only attend to unfinished and new business, but will endeavor to visit the various automobile shows, which are held earlier in England and Europe than in this country.

As a result of Mr. Smith's first trip, the officials of the more prominent automobile and railroad companies abroad are now familiar with U-S-L products and the U-S-L trademark is already associated with English and European manufactories. Mr. Smith has announced no definite date for his return to America.

The Eichoff Wire Reels.

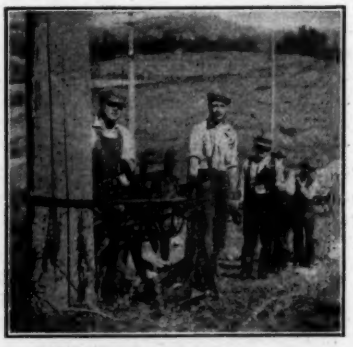
Mathias Klein & Sons, Canal Station, U 34 Chicago, announces that the Eichoff combined take-up and pay-out wire reel is now for sale. This reel is "a handy reel" be-



Eichoff Reel Operated by One Man.

cause it embodies the pay-out and take-up features, obviating the necessity of using two reels.

It is also claimed for the reel that it will save two or three men's labor in coiling up wire. Another feature, which permits its use in hilly or mountainous regions,



The Old Way, Requiring Five Men.

is that it is not necessary to level off a place to stand the reel for taking up wire, as it can be clamped to a telephone pole, tree or any convenient post.

The Ericsson Indicator Jack.

Every once in a while some one makes an improvement in a standard article, and then it is said: "Why didn't some one think of that before?" That is now just what is being said by many of the users of the compact and satisfactory Ericsson "Indicator Jack," the type of drop being furnished in switchboards manufactured by the Ericsson Mfg. Co., of Buffalo, and which is said to be a wonderfully convenient and efficient drop.

It takes up but very little more room than a jack, so that it can be installed easily, it is claimed, in any board where there is any room at all to spare. A small, white, ring-shaped shutter makes its appearance when a call comes in, and this is restored automatically when the operator inserts her plug. For a board that needs a few more lines, these drops are stated to be just the thing and of course if one is buying a new switchboard, he will probably wish to specify this type of signal. Anyone interested would do well to write for full information.

Telephone Improvement Co.'s Northwest Agent.

The Telephone Improvement Co., Chicago, negotiated a contract with Charles Hall of Hood River, Oregon, on October 10, whereby Mr. Hall will represent the Telephone Improvement Co. as sales agent throughout the Northwest. Mr. Hall is president of the Oregon-Washington Telephone Co., whose automanual plant at Hood River is a model of modern telephone construction in every respect. This plant was engineered by W. N. Winters, superintendent of the Oregon-Washington Telephone Co., and Mr. Winters will take active interest in the sales agency for the Telephone Improvement Co. as Mr. Hall's assistant.

Mr. Hall is a graduate of Michigan University and is one of the Hood River pioneers, having taken a prominent part in the development of the Hood River Valley into the most successful fruit-growing section of the United States.

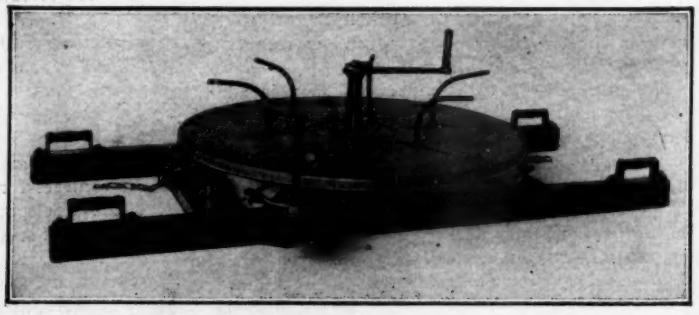
Paragraphs.

THE M. W. DUNTON Co. has moved into its new office building located at 150 and 152 Niagara street, Providence, R. I.

THOMAS A. EDISON, Incorporated, announces the election of E. E. Hudson as fourth vice-president of the company. Mr. Hudson will continue as heretofore in charge of the sales of the primary battery department with headquarters at Orange, N. J.

Proposed Purchases by Bell Co. of Pennsylvania.

At a special meeting of the stockholders of the Bell Telephone Co., of Pennsylvania, at Philadelphia on November 26,



The Eichoff Wire Reel.

there will be submitted for approval or disapproval six agreements for the sale to that company of The Enterprise-Halifax Telephone & Telegraph Co., The Strasburg Telephone Co., The Landisville Telephone Co., The Womelsdorf & Rehrersburg Rural Telephone & Telegraph Co., The Delta Telephone Co., and The Trexlertown Telephone Co., of Pennsylvania.

Consolidated to Have Offices at Hazelton, Pa.

The general offices of the Consolidated Telephone Companies of Pennsylvania are to be removed from Philadelphia to Hazelton, Pa., where elaborate quarters are being arranged in the new Markle bank building.

Legal Cases and Decisions

By A. H. McMillan

Assignable, Taxable and Alienable Franchise.

The Supreme Court of the United States has decided the case of the city of Owensboro, Ky., against the Cumberland Telephone & Telegraph Co., involving an injunction against the enforcement of a municipal ordinance repealing the franchise. The injunction against such enforcement was allowed to stand. The court held that the municipal ordinance granting a franchise was the grant of a property right, which is assignable, taxable and alienable.

The court held that such a grant was one of a property right perpetuity, unless limited in duration by the grant itself, or as a consequence of some limitation imposed by the general laws of the state or by the corporate powers of the city making the grant. The grant is not limited in duration to the corporate life of the grantee.

Where companies were consolidated under the authority of the act of April 5, 1893, of the state of Kentucky, the street rights of the constituent companies passed to the consolidated company by virtue of the express provision of that act, vesting such company with all the property, business, credits, assets and effects of the constituent corporations without deed or transfer, and binding it for all their contracts and liabilities. City of Owensboro vs. Cumberland Telephone & Telegraph Co., 34 Supreme Court Reports, 988.

Injury to Groundman by Falling Tree.

In an action by a groundman of the telephone company for injuries received by a tree falling on him, the petition alleged that the duty of the company was to furnish him with reasonably safe tools and appliances and place to work, and to exercise ordinary care not to order him to perform his duties in a dangerous way, but to order them to be done in a safer way; that the company's foreman was negligent in performing certain acts, when he knew, or ought to have known there was another safer way; and that the company was negligent in furnishing an unsafe place for him to work. It was not alleged that the dangerous method was not reasonably safe.

The court held that this was a sufficient statement of the cause of action. The specific charge was that the foreman instructed the line gang to top a tree and pull the top on to a bridge, while the groundman was standing upon a plank resting upon the bridge and a limb of the tree. The foreman did not give specific orders as to the work. The line gang pulled the tree over toward the bridge and thus injured the groundman. The court held that the contributory negligence of the groundman and the negligence of the company were for the jury. Erwin vs. Missouri & Kansas Telephone Co., 158 Southwestern, 913.

Damages for Erection of Poles on Railroad Right of Way.

A railroad company permitted the adjoining landowner to cultivate part of its right of way not occupied by its roadbed. The telephone company erected ten poles on land to which the land owner was entitled, but it appeared that all but three were on the right of way. No compensation had been made to the landowner for the right of way across her land. She began suit against the telephone company for damages sustained by reason of the maintenance of the poles along her land, and to have a lien declared on the telephone line for the amount of damages recovered.

It was found that the three poles were placed on her land by mistake, the intention being to follow the right of way of the railroad company, and that the telephone company had offered to remove the poles. The court held that it was proper to decree that the company should remove the poles; refused to award damages on account of the presence of the poles on the edge of the plaintiff's land, and divided the costs between the parties. Campbell vs. Southwestern Telegraph & Telephone Co., 158 Southwestern, 1085.

Telephone Lineman and Light Wire.

A telephone company had lawfully erected its poles between the wires of an electric light company. A lineman of the telephone company sent to repair its line had to climb one of the poles between the electric wires. In so doing he received a shock from the electric wires, and, falling to the ground, was killed. The electric light company had constructive notice of the condition of its wire.

The court held that the electric light company was bound to know that the employe of the telephone company would do just what he did in this case, and, being bound by such knowledge, was under the duty of using the highest degree of care practicable to avoid injury to any one who might be lawfully near such wires. The court also held it was no defense that the telephone company had not used proper care to protect its employe from the negligence of the other company. Hipple vs. Edison Electric Illuminating Co. of Pottsville, 87 Atlantic, 297.

Tax Exemption of Small Companies.

Exempting the property of telephone companies whose gross receipts for the year do not exceed $500 from the *ad valorem* tax imposed by Act 49 of the Michigan Acts of 1909, does not render the statute invalid under the 14th amendment to the United States Constitution as denying the equal protection of the laws, where under the classification made by the statute, the companies taxed are mainly those organized for profit, while the untaxed companies are mainly not profit making but mutual or co-operative. So held the Supreme court of the United States in a suit brought by the Citizens Telephone Co. of Grand Rapids to enjoin the auditor general of the state from collecting a tax on the property of the company.

The court also held that the purpose of the act was sufficiently expressed in the title to satisfy the state constitutional provision that no law shall embrace more than one object, which shall be expressed in its title. Citizens Telephone Co. vs. Fuller, 34 Supreme Court Reporter, 833.

Injury to Horse Left in Highway.

Suit was brought against a telephone company to recover $175 damages to the plaintiff's horse, caused by his becoming entangled in some wire, which it was alleged was negligently allowed to remain in the public road by the company's servants. It was alleged that while riding along the road at night, the horse became entangled in the wire and was injured.

A judgment against the telephone company was reversed because the court refused to charge the jury, as the telephone company requested, that if the jury believed that if an ordinarily prudent man, situated as the company was, would have left the wire there, the company was not negligent, since without such a charge the jury was not instructed as to the degree of care required of the company. Southwestern Telegraph & Telephone Co. vs. Thompson, 157 Southwestern, 1158.

Foreclosure on Telephone Company.

Where a trust company which was mortgagee under a mortgage given by a telephone company before the appointment of a receiver, seeks to foreclose such mortgage, it is a question of procedure whether the foreclosure shall be allowed in the same suit in which the receiver was appointed, or in a separate suit. This was the holding of the Supreme Court of Washington in an action brought by the Washington Trust Co. against the Local Long Distance Telephone Co. of Seattle. Washington Trust Co. vs. Local Long Distance Telephone Co., 132 Pacific, 398.

Installing Telephones.

In an action for injuries to an employe of a telephone company, caused by a fall from a step ladder, the company may show that he had used the step ladder in similar work, and prove any other fact connected with his use of the ladder which may tend to show his knowledge of its defective condition. East Tennessee Telephone Co. vs. Jeffreys, 157 Southwestern, 3.

Making Repairs.

A telephone company is entitled to a reasonable time in which to make necessary repairs in its wires, rendering public travel dangerous before it is chargeable with negligence in failing to make proper repairs. Notice that wires are down in any part of the town is not sufficient to charge the company with negligence, unless it had notice of the condition of the wire at the place of the accident. The company's duty is to exercise ordinary care to maintain its wires so as to prevent their becoming dangerous, but this duty is absolute. So held the Appellate Court of Indiana in the case of Home Telephone Co. vs. Weir, 101 Northeastern, 1020.

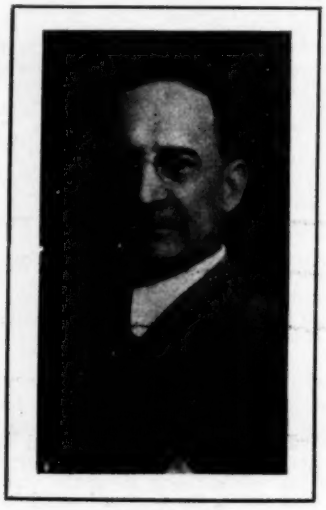
Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

H. F. BRESLER, who has been manager of the Mechanicsburg Telephone Co., of Mechanicsburg, Ohio, for several years, has tendered his resignation.

C. B. HALL, who has just recently accepted a position with the Michigan Railroad Commission as chief of the telephone department, and who was formerly general manager of the



C. B. Hall.

Washtenaw Home Telephone Co., of Ann Arbor, Mich., until the sale to and merger with the Michigan State Telephone Co., will personally take charge of a complete survey of the telephone industry in Michigan. In his new position he will have charge of all supervisions and he is at present engaged in conducting an investigation in Detroit. Mr. Hall is well and favorably known among the telephone men of Michigan and number of other states. His wide range of experience will make his services valuable to all concerned.

H. A. BROWN, formerly connected with the Sheyenne Telephone Co., at McVille, N. D., has been appointed manager of the Griggs County Telephone Co., at Cooperstown, N. D.

BERT HAHN, formerly special agent for the Hawkeye Telephone Co. in central Iowa, has been appointed manager of the Perry, Iowa, exchange, succeeding S. E. Clapp, who has been transferred to Bloomfield.

R. D. BLOWERS, who for the last 23 years has had charge of the interests of the Southern Bell Telephone & Telegraph Co. in Spartanburg, S. C., has resigned the active management of the local exchange, but will continue to be connected with the company. D. E. Myers, of Atlanta, Ga., will have direct charge of the plant.

HERBERT F. MORGAN, for the past two years resident agent in charge of the exchange of the New York Telephone Co., at Owego, N. Y., has been transferred to Oswego, where he will enter upon new and enlarged responsibilities. Leon R. Walters, who has been employed in the Owego office under Mr. Morgan, will succeed him as resident agent.

MRS. M. H. MEDBURY, who has been with the Southern New England Telephone Co.'s office at Putnam, Conn., for more than 22 years, has resigned her position as manager. She will be succeeded by W. L. Moran, manager of the Danielson and Moosup exchanges, who will have charge of all three exchanges. Mrs. Medbury entered the employ of the company in 1891 as assistant to the manager. After 11 years of faithful service, she was appointed manager, at which time there were only 167 stations in the entire Putnam division, whereas at this time there are 1,450, a great part of this growth being due to the untiring efforts of Mrs. Medbury. Mrs. Medbury is eligible to receive a pension and insurance benefit from the company as a reward for her many years of service.

New Companies and Incorporations.

SIGEL, ILL.—Articles of incorporation have been filed by the Sigel Mutual Telephone Co., with $5,000 capital stock. The incorporators are: A. W. Bigler, A. R. Chestnut and Hiram J. Walker.

HANSTON, KANS.—The Hanston Telephone Co. has been incorporated with $1,500 capital stock. The incorporators are: John Bauer, H. F. Solmans, H. A. Shultz, L. F. Holmes, C. B. Wycoff, J. B. Eakin and W. J. Auerbach.

FAIRBURY, NEB.—The Fairbury Telephone Co. has filed articles of incorporation with the secretary of state. The capital stock of the company is $5,000 and the incorporators are: Charles B. Letton, John Heasty, Andrew Lindell, Edward C. Hansen and L. W. Goodrich.

MINOT, N. D.—The Harrison Telephone Co. has been organized to construct a line about 12 miles long north and east of Minot.

Construction.

REEDLEY, CAL.—The Reedley Telephone Co. has plans under way for the erection of a new exchange building in this city. Besides the building, an appropriation of $2,500 has been made for outside construction and improvements.

SOUTH PASADENA, CAL.—The Pasadena Home Telephone Co. is planning a new trunk line between South Pasadena and Los Angeles.

SHEBOYGAN, WIS.—The Citizens Telephone Co. will make considerable extensions to its system. At the present time the company has a large number of orders on file which cannot be installed until the additional cables are placed. When the work is completed the company will be able to handle 1,000 more telephones. Walter Gallon is manager.

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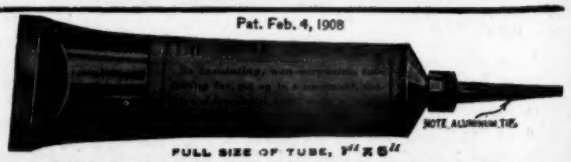

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